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An Irishman might say that the problem of inoperable carcinoma of the rectum can only be solved by diagnosing it at a sufficiently early stage to render it operable. He would be right. But with semi-accessible and, more especially, inaccessible carcinoma for many and obvious reasons this is not possible. There must always be a considerable number of patients who are inoperable before they come to the surgeon. Early diagnosis is of the greatest importance, but we deal here with patients who for one cause or another have passed beyond this stage.

SYMPTOMS

In late cases the symptoms complained of are as follows. There is looseness of the bowels, with three, four, or more motions a day; this is the most significant symptom even in early cases. It is especially noticeable with the prominent redundant growth low down in the bowel. Quantities of mucus are passed in the stools, which sometimes consist of little else; it is the mucus that causes the repeated motions. The presence of a tumour low down in the bowel gives rise to that feeling of dissatisfaction when the motion has been passed, as if there were more to come. The presence of blood is variable; it is often present in small quantities but sometimes only in attacks, when much may be lost.

Pain is always a late sign and is of two kinds. There is colic, especially severe with a scirrhous growth, constricting the bowel and narrowing the lumen as if a tape had been tied round it ("string stricture"). This comes on in bouts and is accompanied by rumblings and gurglings—what the patient terms wind, which, if he is observant, he will notice gradually becoming more and more pronounced. Then there is the other kind of pain, the dull ache which is always present. This is partly due to the ulceration and partly to the extension outside the bowel wall involving the neighbouring structures, especially the nerves.

The other symptoms include loss of weight, anæmia from loss of blood, and, more especially, toxæmia due to absorption from the bowel; and a loss of appetite may have become apparent. In advanced cases these symptoms are all found, though they vary in severity from case to case.

DIAGNOSIS

Diagnosis is simple and can usually be made by the finger in the rectum. Less often the sigmoidoscope is needed, and still less often we have to rely on the barium enema and radiography; but both these methods may at times be indispensable. Diagnosis by the barium enema is best made as the fluid runs in and the bowel is manipulated by the hand pressing on the abdomen. It is advisable for the surgeon to be present and to see this done. Photographs are taken as a record of the obstruction and are useful for showing to the relations and even the patient as evidence of what is termed "his stricture." Even when the finger can reach and diagnose the growth, a barium enema is most useful and should always be given. The information thus obtained may save much time if an operation is carried out.

Diagnosis at this stage, after the patient has been ailing for some time, is not quite the shock it is when made early while the patient is yet in robust health; but still it is not pleasant, especially as one cannot be open and frank with the patient. The relations, with whom one is unreserved as to the state of things, and what ought to be done, and the best way of doing it, are often for a while terrified by the catastrophe which they realise is about to befall them.

TREATMENT

A decision has now to be made as to what is the best thing to do, and it is not easy to decide at a moment's notice. It is better for the surgeon to have a talk both with the doctor and with the relations, first separately and then together, before deciding what to advise the patient; and then to tell the people to talk the matter over with the doctor who is, after all, the person on whom they are going to rely more and more in the future and the one whose advice they will most readily follow. It is necessary for the surgeon to have in his mind clearly the possibilities of the case, and the family should also be made conversant with them.

To begin with, the radical operation in the ordinary case in the hands of the most expert has a case-mortality of 1 in 5. In the hands of the surgeons of the smaller provincial and cottage hospitals it has a mortality which is presumably much higher. The operation therefore should be considered to be one with a high fatality-rate and never to be undertaken lightly. We are only dealing here with the late case.

Next, the general health of the patient should be gauged with accuracy. Experience has impressed upon me that the age of 65 is the limit beyond which it is unwise to operate. If the general health has been undermined by the disease, if there is loss of weight, if loss of blood has caused anæmia, or if the patient has become toxic from bowel absorption, the operation should not be urged, and if the cardiac or vascular system is not first-class, or if there is diabetes or renal disease, the operation is out of the question. From this it will be seen that there will be many cases which will require some other form of treatment.

Let us discuss the advice we give to a patient who is young and in fair general health, and in whom we are not yet sure that the disease is irremovable. The best thing to do is to perform a laparotomy and to explore the condition through a median incision below the umbilicus. The growth is examined as to its nature, its fixity, and its extensions, together with the glands draining the region; and the possible peritoneal extensions, and above all the presence or absence of metastases in the liver must be ascertained.

When we have decided that the state of affairs is such that radical removal cannot be performed, a colostomy should be arranged through a separate opening on the left side. The patient should be warned beforehand of the possibility of having a colostomy. The colostomy should be made through a large skin incision and a small incision in the muscles, which should be split. The bowel is pulled up as far as possible, so that the opening is as near the growth as may be and there is a more or less straight passage

along the gut to the growth. This is important for future treatment.

The idea of a colostomy is repugnant to most people, but it is astonishing how little a well-managed colostomy incommodes the possessor. My patients are all recommended not to use a catheter to wash out the bowel, but to use a stomach-tube, which they pass right round to the cæcum and so wash out the large bowel completely; they then empty it of fluid and are safe for the next twenty-four hours. During this time the large bowel gradually fills again, and it should always be emptied at the same hour each day. Nothing could be simpler, and nothing could be more effective. A piece of lint and a flat rubber pad are all that is worn over the colostomy opening.

A word may be said about the advantages of a colostomy, which in my opinion are very great. To begin with, the rate of growth of a carcinoma depends on its blood-supply; vascular tumours grow quickly, whereas avascular tumours grow slowly. Fæcal material passing over a tumour irritates it, causes it to bleed and secrete mucus, and so increases the vascularity and therefore the rapidity of the growth. A colostomy confers freedom from all such irritation. The constant passage of mucus is lessened, the bleeding is allayed, and the general health and well-being are much improved. The removal of the obstruction removes the toxæmia, and all colicky pains disappear; these are great assets to the comfort of the patient, and the outlook on life improves immensely. For these reasons I am in favour of performing a colostomy in every inoperable case.

Now let us turn to the patient whose general health, age, or the condition of the growth obviously precludes the possibility of a radical operation. Here we have to make up our minds whether we recommend the patient to have a colostomy performed at once, or wait until symptoms develop which compel us to perform one. In many cases this is difficult to decide. My opinion is that the facts had better be laid before the patient, who should talk the matter over with his wife and his doctor and then decide for himself. I favour a colostomy for the reasons given above, but it is better to let the patient be master of his own fate rather than to urge him in any one direction.

Should he decide on a colostomy, the opening can be made in the left iliac fossa. The interior of of the abdomen can be explored through the incision and the inoperability confirmed. There is more liability to the development of a hernia through a large incision in the muscles at this point than if the bowel is brought up through a small separate opening. Again the opening in the bowel should be as near to the tumour as possible for subsequent treatment.

In many cases the age is so advanced, the system so undermined, and the disease so extensive, that it is questionable whether it is worth while doing anything. In these cases a very useful method of treatment can be carried out with conspicuous success in most instances and amelioration of the symptoms in all—namely, the application of radium to the growth. It should be made plain to the relations why radium is used. No hope of cure should be expressed, but a confidence may be given as to the relief from, and the avoidance of, certain most unpleasant symptoms. In most cases too there is a prolongation of life, and a not too unpleasant life. There may even be a return to work for a time. Should the miracle happen, they can attribute it to whom and what they please.

What are the symptoms likely to develop if nothing is done? These we find are just those which give the most unpleasant features to carcinoma of the rectum; they are due to the spread of the disease to neighbouring parts. We have mentioned the constant aching pain of ulceration. When this extends backwards to the sacrum and outwards to the sacral nerves, it is greatly aggravated, shoots down the back of the thighs, and becomes almost intolerable; large doses of sedatives are required to control it. Even more misery is caused by extension forwards: in the male to the prostate and bladder, causing genito-urinary distress; in the female to the vagina and uterus. When genito-urinary symptoms are added to the patient's misery, he has no peace, and life becomes unbearable.

Radium will materially cut down the blood-supply of the tumour. According to B. D. Pullinger and other workers, restriction of the blood-supply is one of the chief modes of action of radium. Owing to its action in stopping the mitosis of cells, the growth of the tumour will cease for a time, and fibrous tissue will form. Under its influence the tumour will become less vascular, smaller, and more fibrotic, and shrinkage will continue for some time. The application of radium is then repeated. How far this shrinkage will continue depends on the dose, its accuracy, and the number of applications. A good deal of this depends again on the coöperation of the patient. Before the dosage of radium was as well understood as it is today grave disadvantages might follow its use.

A friend of mine was treated by radium alone, which was inserted interstitially between the bowel and the sacrum in a large and concentrated dose, and the radium was inadequately protected. The result was that the bowel sloughed, the bone necrosed, and there was a constant leakage of bowel contents over a most sensitive sloughing area which had no chance of healing. He died worn out with pain the result of his treatment rather than from the disease from which he suffered.

This was not a rare phenomenon in the early days, when knowledge only advanced by the slow process of trial and error. It was these results and similar ones in other parts of the body which gave radium the bad name from which it is only now recovering. Now there is no contra-indication to radium given in the right dose adequately protected. Nothing but good can come from its use.

The treatment, now more or less stereotyped after a long experience of trial and error, is as follows:—

Well-screened and protected radium 20–30 mg. is mounted on four strands of twisted copper wire, gauge 23, which is stiff enough for manipulative purposes and yet perfectly flexible. This is inserted into the anus and guided by the finger or through a sigmoidoscope into the stricture, and the end is coiled up and fixed to the buttock with strapping; it is left in place for twelve hours. It is then removed and inserted for twelve hours into the lower opening of the colostomy, a specially narrow sigmoidoscope being used to place it into position. The importance of having the colostomy opening as near the tumour as possible now becomes apparent. The coiled end of the wire is fastened to the anterior abdominal wall with strapping, one or two days' interval is allowed, and the procedure is repeated at both the anus and the colostomy opening. In the female an additional port of entry for growths low down is obtained through the vagina, the bladder being packed forwards.

In this way a dose of 1000–2500 mg. hours is given to the tumour, which is ample to begin with. Experience alone enables one to estimate the dose according

to the size of the tumour. This is repeated in fourteen days and again in a month's time. Very shortly a considerable change will be noted in the tumour, a two months' interval is allowed, and then longer and longer intervals are arranged, according to the reaction desired and obtained.

In many cases the growth will shrink in an extraordinary manner, and in some cases it has disappeared from the interior of the bowel, all discharge and bleeding having stopped and all pain having passed off. In one or two cases—e.g., cases 1 and 6—nothing can be felt except a stricture where the growth previously existed. This local action is all that can be expected, though the patient may foster hopes of a cure, hopes which are rightly encouraged by the relations and the doctor; but, if extension has already taken place to the glands, or if there are metastases already in the liver, these must take their course. At the same time the patient will be spared the really disagreeable features of the disease. Later, radium applications are required only if there is any return of local activity, as shown by a return or increase in the discharge, the bleeding, or the pain. Most of the painful aspects of the disease are thus eliminated. If, however, pain becomes a feature and cannot be controlled by sedatives, a few doses of deep X-ray therapy should be tried—the kind of treatment does not seem to be of importance. This sometimes has a considerable effect in diminishing the pain; more than this cannot be expected in these advanced cases.

The end of carcinoma of the rectum which pursues its way unchecked is a mournful and sad affair and sedatives are needed in increasing quantities; but if the local extension can be checked the disease does not assume the same terrible and repulsive aspects. Death from internal metastases in the liver and elsewhere is not a long nor a very unpleasant process.

The following cases illustrate most of the points mentioned, and the results are considered highly satisfactory.

CASE-RECORDS

CASE 1.—A woman, aged 59, had been ailing more than a year, with spasms in the abdomen, loss of weight, and the passage of mucus and blood, and had been treated with vaccines for colitis. In the last three weeks she had had wind, gurgling and violent spasms. On examination she was anæmic and appeared toxæmic, with visible peristalsis and a tense tumour felt in the left iliac fossa. Sigmoidoscopy revealed nothing. Radiography showed a stricture in the pelvic colon.

At laparotomy on June 8, 1933, were found a large tumour in the pelvis, adherent to the wall and irremovable, a few glands close by, and a nodule of uncertain nature in the liver. Colostomy was performed. Radium was applied twice during convalescence, and four times during the next eighteen months. The patient gained weight steadily and was restored to health. From 1936 to 1939 she had four more applications in smaller doses. The colostomy opening had to be enlarged but otherwise gives no trouble. The growth has shrunk to a tight hard stricture. The patient is 2 st. heavier than she was when first seen five and a half years ago.

CASE 2.—A man, aged 62, was first seen on Oct. 24, 1933, with a six months' history of bowel upset, with the passage of two to four motions a day, containing mucus and sometimes a tinge of blood. He had lost 2 st. during the last year. Colic and rumblings had increased of late, and there was severe constant aching pain. Radiography suggested a bony tumour low down in the pelvis. On examination he was pale, anxious looking, and stout, with a distended abdomen. Per rectum a growth was felt with the finger-tip.

Laparotomy in the Royal Masonic Hospital revealed a fixed inoperable mass with extensive spread and large glands. Colostomy was performed. Radium was applied during convalescence. Subsequently radium was applied twice, with a gradual cessation of symptoms. The patient gradually failed and died in November, 1934.

CASE 3.—A woman, aged 60, was seen on April 10, 1930, with definite symptoms for more than two years with constant pain and loss of weight, but her illness had not been diagnosed. On examination she was still a stout person. Per rectum a large cauliflower-like growth was found, occupying the lumen of a distended rectum, well within the reach of the finger.

Laparotomy showed that the growth was fixed to the floor of the pelvis, and masses of glands were felt over the common iliac vessels. Nothing was felt in the liver. Colostomy was performed. Radium was applied through the vagina, the anus, and the colostomy. In two months the growth became much smaller and her general condition improved immensely. In the next eighteen months she had three more applications of radium, her growth shrivelled to insignificance, her symptoms ameliorated, and she was fairly comfortable. A turn then came, and she went downhill rapidly and died in February, 1932.

CASE 4.—A woman, aged 75, seen on Jan. 4, 1933, had suffered from wind for six months. She used to be very active but was now no longer so. She always took aperients, had noticed mucus and even blood in her stools, and thought she had piles. She had lost a little weight. On examination she was thin, anæmic, and appeared toxæmic. A thick rigid colon was felt on the left side, the cæcum was distended, and peristalsis was active. Nothing abnormal was felt per rectum. Sigmoidoscopy showed a fungating stricture about 8 in. from the anus. Obstruction seemed imminent.

Laparotomy revealed dense adhesions round the mass, hard glands, liver free, colon packed with fæces. Colostomy was performed. Nothing could be obtained from the colostomy opening but a few hard masses in spite of all treatment. On the 12th vomiting and urgent symptoms started. The patient was washed out and "quarried" out with the handle of a dessert-spoon two or three times a day, a little being brought away each time, and oil enemas were given. She was acutely ill, but it was not until the 24th that the last solid masses were cleared away, the bowel could be washed free, and the abdomen at last became flaccid. The vomiting and colic then stopped. During convalescence radium was given through the vagina, the anus, and the colostomy, and thereafter repeated at intervals. Her health improved, and during the year she became more energetic and attended social functions, such as Ascot and the opera. The growth discharged very little and gave her little trouble, but after eighteen months her appetite failed, and she went downhill rapidly, dying in May, 1934.

CASE 5.—A man, aged 65, seen on April 24, 1933, said that his bowels had been regular until two months ago, when they became frequent and no longer felt as if they emptied. Mucus and blood had been noted lately with griping pains and loss of weight. On examination nothing abnormal was found in the abdomen. Per rectum a stricture was felt about 3 in. from the anus, ulcerated at one side.

At laparotomy in the Royal Masonic Hospital the condition was thought to be operable, no glands were felt, and there was nothing abnormal in his liver. He then ran a temperature and developed lung trouble, and the radiologist reported a metastasis in the right lung, but both Dr. Chas. Box and I thought it was inflammatory, and later it cleared up. Nevertheless this made us think that radical operation was inadvisable. Radium was given, and he gradually

improved in health, gained weight, and returned to his work as a salesman. He was in hospital for week-ends four times in 1934 and had radium. He remained in fair health until the end, when he developed generalised carcinoma and required morphine. He died on Oct. 9, 1935.

CASE 6.—A man, aged 59, seen on May 9, 1935, said that a few months ago he had had severe pain in the lower part of the abdomen, vomiting, and a temperature. This passed off, but the bowels had never been normal since, and he always had wind and colic. Mucus and blood had not been noticed, but he had lost much weight. Radiography after a barium enema showed a stricture in the lower part of the pelvic colon.

Laparotomy was performed in the Royal Masonic Hospital. The pelvis contained a growth attached to the anterior wall, enlarged and hard glands were found in the mesentery, and nothing abnormal in the liver. The condition was inoperable. Colostomy was performed and radium given. In 1936 he had radium three times, and by the middle of the year he had returned to work in the coal trade and was motoring 600 miles a week. In 1937 an obvious stricture in the bowel seen through the sigmoidoscope was all the evidence remaining; he was 3 st. heavier than when first seen. In 1938 he had two applications of radium, the last in December. He is still at work and looks and feels well. The colostomy "gives no trouble to him, so long as he takes trouble with it."

CASE 7.—A man, aged 58, seen on Dec. 19, 1933, had had typical symptoms for some months and was diagnosed as cancer of the rectum before I saw him.

Laparotomy in the Royal Masonic Hospital showed that the condition was inoperable, and radium was given. During 1934 he had three more applications of radium, his health improved, and he returned to work in March of that year. He remained well until the end of 1937, when he developed generalised carcinoma. He died in the early part of 1938.

CASE 8.—A woman, aged 64, was admitted to St. Mary's Hospital in February, 1934. She could not say when symptoms started. There had been frequency of bowels and passage of mucus and blood. The patient had been losing weight. On examination per rectum a growth was found well within reach of the finger.

Laparotomy revealed a fixed growth adherent to the neighbouring structures. Nothing abnormal was felt in the liver. A colostomy was performed and radium applied. Later, radium was given on five separate occasions. In March, 1939, the patient felt and looked well and did her own housework unaided. A shrivelled growth could still be felt, but the mucous membrane over it appeared healthy. Sometimes there was a slight discharge, but otherwise there were no symptoms. The patient is still well and says that her colostomy never bothers her.

SUMMARY

(1) The symptoms of inoperable carcinoma of the rectum are (*a*) frequency of defæcation, with the passage of mucus and, occasionally, blood; (*b*) pain, which consists both of spasmodic severe colic, associated with increasing rumblings and gurglings, especially in scirrhous carcinoma, and of a dull constant aching, due partly to ulceration and partly to extension to adjacent structures, especially nerves; (*c*) loss of weight; (*d*) anæmia; (*e*) toxæmia; and (*f*) anorexia.

(2) Diagnosis is easy and can usually be made by digital rectal examination. If not, sigmoidoscopy, or else radiography after a barium enema, may be necessary.

(3) Treatment is more difficult. Operation should not be urged if the patient is over 65, or if there is loss of weight, anæmia, or toxæmia. If the cardiovascular system is not good, or if there is diabetes or renal disease, the case is inoperable. If there is doubt about the inoperability, laparotomy should be performed to enable the growth to be examined. If the growth then proves to be irremovable, a left colostomy should be made. If laparotomy is not necessary to confirm inoperability, the patient should be left to decide whether to have a colostomy or not, after having a full explanation from the surgeon. In cases in which even a colostomy seems to be contra-indicated palliation of symptoms and prolongation of life can be aided by the application of radium.

TREATMENT OF EPILEPSY WITH SODIUM DIPHENYL HYDANTOINATE

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LAST year Merritt and Putnam (1938) reported favourably on a trial of sodium diphenyl hydantoinate in epilepsy. In their series toxic symptoms were seen in 15 per cent. of cases, though they were mainly transient and without danger. The reports that have since appeared have shown this substance, although of great benefit in epilepsy, to be more toxic than other established and efficacious drugs, whose toxicity in therapeutic doses is of little moment. To justify its use in treating epilepsy it would therefore have to produce a much greater anticonvulsant effect than the other drugs, and would have to succeed where other therapeutic methods had failed. For this reason it was decided to carry out a therapeutic trial on a selected group of epileptic patients who had been closely followed for many years, and whose condition had not been greatly influenced by other forms of treatment.

MATERIAL

The ninety-one subjects of this inquiry were patients attending the National Hospital, Queen Square. They all lived a fairly normal existence at home, many earning their living and others being dependent on their relatives. They therefore represented the type of epileptic patient met in the general population, and the conditions under which they were treated more closely approached those found in private practice than in institutions. The results of treatment are so far inconclusive in eight patients, so that eighty-three are included in the report.

These patients had been observed regularly in the National Hospital for periods ranging from 6 months to 31 years with an average of 6·4 years; thirty-eight had been admitted to the hospital for investigation and stabilisation of treatment, and since discharge all but eleven of these had been observed regularly as outpatients. An exact record of the course of the disease and of its response to alterations in treatment over many years was thus available in all cases. As far as possible patients were selected for the trial whose epilepsy had progressed steadily in severity in spite of carefully controlled treatment. In all cases the response to the previous treatment was proving unsatisfactory when treatment with sodium diphenyl hydantoinate was begun. The patients' ages ranged from 9 to 59 years, and epileptic fits had been present for 1 to 45 years, the average length of history being 14 years. I am indebted to the physicians under whose care they were for permission to investigate the cases and for their coöperation.

In many patients fits had been observed in hospital, in others the history was conclusive, and in a few

whose accounts were inconclusive the diagnosis was made by electro-encephalography. The incidence of the different types of epilepsy was as follows:—

Type of fit	*Patients*
Grand mal	72
Petit mal	35
Psychomotor	11
Grand mal and petit mal	28
Grand mal and psychomotor	7

As would be expected in such a series every orthodox form of treatment had been used. After investigations, including encephalography and ventriculography, craniotomy had been performed in a few cases. In some, ketogenic diets, water and salt elimination, snake venom and other methods of treatment had been used with varying success, but in all cases, before sodium diphenyl hydantoinate was used, various combinations of phenobarbital and allied barbiturates, with mixtures containing bromides, borax and belladonna, had been given a long trial. The most usual dosage was gr. 2–3 of phenobarbital with gr. 30–40 of bromide and gr. 20–30 of borax daily, but some patients received far larger doses than these.

DOSAGE AND RESULTS

The longest continuous period of treatment with sodium diphenyl hydantoinate was 10 months, the shortest 6 weeks, the average duration in eighty-three cases being 4·1 months. Epanutin (P.D. & Co.) or sodium diphenyl hydantoinate (B.D.H.) was given in capsules of 0·1 gramme. An initial daily dose of 0·2 g or 0·3 g. was slowly increased, and 0·6 g. daily was given in some cases. Phenobarbital and bromides were continued in decreasing doses during the period of substitution, and, as will be shown later, it was sometimes necessary to reduce the dose of sodium diphenyl hydantoinate and to supplement it with other anticonvulsants. After trial of the drug alone the following combinations were found to give an optimum therapeutic effect.

	Cases
Sodium diphenyl hydantoinate alone	52
with phenobarbital	9
with bromides	16
with phenobarbital and bromides	6

The results of treatment over an average period of 4·1 months are shown in the table which follows. It is probable that some of the cases in the "relieved" group will later fall into the "improved" group, and that in time some of the beneficial effect of the drug will be lost, for experience with other anticonvulsants in this series has shown that even a trivial alteration in treatment may cause many months' remission in the fits.

EFFECT OF SODIUM DIPHENYL HYDANTOINATE ON THE INCIDENCE OF DIFFERENT TYPES OF EPILEPSY

Result	Grand mal	Petit mal	Psycho-motor	Mixed
	Number and percentage			
Relieved	15 (20·8)	6 (17·1)	1 (9·1)	4 (14·3)
Improved	42 (58·3)	16 (45·7)	6 (54·5)	17 (60·7)
Unchanged	10 (15·3)	9 (25·7)	4 (36·4)	5 (17·8)
Worse	5 (5·5)	4 (11·4)	0 (0)	2 (7·2)
Total	72 (100)	35 (100)	11 (100)	28 (100)

Grouping together those cases which were improved, it is seen that 79·1 per cent. of subjects with grand mal and 62·8 per cent. with petit mal were benefited. In assessing this extremely good result it must be remembered that although the cases were of long standing and the fits had progressed in severity in spite of continuous treatment, the comparison was made between a newly exhibited drug and others which had been taken for months or years. It is probable that if the initial effects of treatment with bromides and phenobarbital could have been compared the contrast would not have been nearly so striking, for some of the case-histories show similar remissions when other forms of treatment were first begun.

A group of cases showed a dramatic and maintained improvement with sodium diphenyl hydantoinate. A detailed report of one of these has already been published (Williams 1939). This patient had had fits every day since infancy, but has been almost normal since beginning treatment with the drug 10 months ago. Fifteen such subjects (18 per cent.) have been selected from the series in view of the long history of frequent and unremitting grand mal and petit mal epilepsy which was cut short with sodium diphenyl hydantoinate. In these fifteen there had been many fits each day for from 8 to 45 years (average 19·8 years) and complete or relative freedom has now been produced for an average of 5 months. None of these patients had had such a remission before.

In some cases no improvement was found with 0·2 or 0·3 g. daily, but the addition of 0·1 g. caused great improvement. It was later found that the addition of 0·1 g. above the therapeutic dose gave toxic symptoms, or that in time continuation of an effective dose of 0·4 g. or more daily produced varying degrees of toxicity. No patient receiving 0·5 g. or more daily was free from toxic symptoms. This suggested that the margin of safety between an adequate therapeutic dose and the minimal toxic dose in these cases was 0·1 g. or less. This observation was so repeatedly made in the present series that it seemed that the anticonvulsant effect might well be the presenting sign of toxicity in subjects receiving more than 0·3 g. daily.

In eight cases it was noticed by the patients or their relatives that although the fits had been greatly diminished in frequency since beginning the new treatment they had increased in intensity or had changed in character. Some of these patients were so distressed at the severity of the fits that they preferred to have their former more frequent but milder attacks and asked to have their previous treatment replaced. In subjects whose attacks had been greatly reduced in frequency many weeks of complete freedom were sometimes broken by isolated episodes when there were several severe attacks within a few hours. One of these patients died in status epilepticus while receiving 0·5 g. daily. It seems that the drug raises the convulsive threshold but has little depressant effect on fits which have managed to cross that threshold. An account of two patients who died in status will illustrate this effect.

CASE 1.—A woman aged 30 had attended the hospital regularly for 10 years and had had major and minor fits for 7 years before that. There were no gross physical abnormalities, her general health had been good and her family history uneventful. Before treatment she had had major fits on the average about once a fortnight but occasionally as many as four a day. There were many minor attacks each day. The major fits were well controlled and the minor were reduced to ten to twenty a month with phenobarbital gr. 1 and sodium bromide gr. 10 t.d.s. This improvement continued for 2 years but the fits then increased again and when treatment with hydantoinate was started she was having fifty to sixty minor attacks with occasional major fits

each month, in spite of receiving phenobarbital gr. 4, sodium bromide gr. 60 and borax gr. 30 daily. For a week 0·1 g. of sodium diphenyl hydantoinate was given with phenobarbital gr. ½ and sodium bromide gr. 10 three times a day. The next week 0·4 g. of the hydantoinate and gr. 1½ of phenobarbital were given daily. The minor attacks fell to three a week. A week after beginning treatment the patient complained of itching, and a generalised morbilliform rash with petechiæ appeared in the flexures and on the palms. There were no other toxic signs, the tongue was clean, there was no adenitis, and the temperature, blood-count and urine were normal. The rash faded in 6 days with some desquamation and brown pigmentation in the flexures, and the patient felt well.

Treatment was continued unchanged for 3 weeks and the dose was then slowly increased to 0·6 g. with sodium bromide gr. 30 daily. With this dose the attacks ceased completely. Further toxic symptoms arose 7 weeks after treatment with sodium diphenyl hydantoinate had been begun. There was nausea, vomiting and anorexia for 4 days. The patient felt giddy and light-headed and complained of tremor, an unsteady gait and double vision. On examination the skin, tongue and mucosæ were normal. The patient was pale and looked ill. She had ataxia, rombergism, fine nystagmus in all directions, a fine terminal tremor of the fingers and coarse bilateral intention tremor. The deep reflexes were equal and very brisk, the abdominals present and the plantars flexor. There were no other physical abnormalities and the blood-count and urine were normal.

The drug was discontinued for 3 days and a reduced dose of 0·5 g. daily was then given. All the symptoms and signs disappeared in 4 days. The patient felt well and was free from fits for 5 weeks on this dose, when she had five major fits in one day. She went into status epilepticus 2 days later and was admitted to hospital. She continued to have major convulsions every 10–20 min. in spite of paraldehyde, phenobarbital, magnesium sulphate and morphia. She died in coma the next morning, the fits having continued without interruption. No gross lesions were found at autopsy.

CASE 2.—A woman aged 27 had had between seventy and a hundred grand-mal fits a year without remissions for 12 years. She had received continuous treatment at the hospital. Hydantoinate was given for 9 months and the fits ceased, except for three outbursts in each of which nine to twelve fits occurred within a week. She had had no fits at all for 2 months while receiving 0·4 g. of hydantoinate and gr. 30 of sodium bromide a day. She then entered status epilepticus, was admitted to hospital and died in two days, with a terminal bronchopneumonia

THERAPEUTIC EFFECT AND TOXIC SYMPTOMS

It was usual for patients to say that they felt less sleepy, that they were more active and that they had a sense of well-being which was absent with large doses of bromides and phenobarbital. Bromide acne cleared up rapidly and the general demeanour of many of the patients suggested greater awareness and alertness. On the other hand, relatives complained of truculence and aggression, and during observation in hospital behaviour disturbances occurred which may have been due to removal of the sedative action of the barbiturates, but which might also be attributed to a toxic effect of sodium diphenyl hydantoinate.

The drug caused symptoms and signs of toxicity in 36 per cent. of the eighty-three cases. The toxic effects closely resembled those described by Merritt and Putnam. Sixteen patients (19 per cent.) developed early symptoms 4–10 days after beginning treatment; these were transient and slight and were produced by relatively small doses. There was generalised pruritus, increased by warmth, with skin eruptions ranging from a slight erythema to a severe generalised macular eruption with petechial hæmorrhages leading in 4–6 days to a branny desquamation with faint brown staining. A mild pyrexia reaching 99·8° to 100·2° F. accompanied the rashes in two inpatients who were more closely observed than the outpatients, and throbbing bifrontal headaches, anorexia and slight nausea were also noticed at this stage. These symptoms were observed separately in different patients. They were unassociated with any other physical abnormalities, and blood and urinary examinations were normal.

Late symptoms were associated with larger doses (0·4–0·6 g. daily) and arose 6–12 weeks after beginning treatment. They usually followed closely on an increase in dosage. They were as follows:—

Alimentary.—Anorexia with lethargy, continuous nausea, epigastric discomfort, vomiting after food, furred tongue and constipation. These symptoms have been attributed to the alkalinity of the drug and are said to be minimised by giving it after meals. No changes like those described by Kimball (1939) were found in the gums.

Nervous.—The following symptoms were met with. Bifrontal headaches, pallor, lethargy, bilateral ptosis, blurring of vision, diplopia, ataxia and fine tremor of the fingers with incoördination in the hands. Abnormal signs were fine nystagmus in all directions, terminal finger tremors, slight incoördination, gross ataxia, with rombergism and extremely brisk tendon jerks. These symptoms disappeared in all cases within 3 days of stopping treatment and did not recur when treatment was recommenced with the dose reduced by 0·1 g. daily.

Mental.—Irritability with sullen restlessness, leading to unprovoked aggression, was reported by relatives of outpatients and observed in three patients in hospital. The following is an account of one of these cases:—

CASE 3.—A man of 24 had had grand mal fits for 10 years. He often had several in one day, but there were remissions of several months from time to time. He was admitted to hospital in status epilepticus and in spite of large doses of phenobarbital and magnesium sulphate he had 30 and 49 grand mal attacks on successive days. He was then given 0·3 g. and later 0·5 g. of hydantoinate and gr. 3 of phenobarbital daily. The fits fell from 40 to less than 1 a day. After a few days he became irrational, truculent and aggressive to the nursing staff and patients. The hydantoinate was replaced by gr. 30 of sodium bromide after 13 days and in a day the patient became quiet, coöperative, and friendly with the other patients and staff. He seemed mentally normal, but had many more fits. After 12 days 0·5 g. of hydantoinate was again used instead of bromides. The fits ceased, but he became abusive and difficult and made an unprovoked attack on another patient. Hydantoinate was therefore discontinued and he became mentally normal again.

Cardiac.—Three patients who had no history of cardiac or renal disease developed changes in cardiac rate during the time that other toxic signs were present.

One patient, aged 20, had a simple bradycardia of 52 per min. 3 months after beginning treatment. Another, aged 58, had a bradycardia of 44 per min. with very frequent ventricular extrasystoles 5 weeks after starting treatment with hydantoinate. The patient complained of weakness, breathlessness, and swelling of the ankles, and showed cardiac dilatation, inversion of the T wave, and clinical signs of cardiac insufficiency. The blood-counts and urinary examinations of these patients showed no abnormality. They recovered rapidly when the dose was reduced and a week later their pulse-rates were 80 and 72 respectively. There were then no other toxic symptoms.

The third patient, aged 34, had his first attack of paroxysmal tachycardia on the way to hospital, two months after beginning treatment. When seen the apex was in the anterior axillary line, and the heart-rate was 180. In this case the attack of paroxysmal tachycardia may merely have been coincidental.

DISCUSSION

Except for the greater frequency and variety of toxic symptoms encountered, the results of this trial are similar to those reported by Merritt and Putnam. The subjects had all ceased to respond to routine treatment with anticonvulsants and the results in some cases show that the drug may be of great value when other anticonvulsants have failed. The less encouraging results in other cases, and especially in the 36 per cent. in whom the drug caused toxic symptoms, indicate that it should not replace the more reliable but less spectacular anticonvulsants at the beginning of treatment. The impression gained during the trial was that in the treatment of epilepsy, after all investigations have been undertaken to exclude a remediable cause, the well-established anticonvulsants—bromide, borax, belladonna and barbiturates (phenobarbital)—should first be used. If these fail, treatment with sodium diphenyl hydantoinate may be of benefit. If relief is not obtained with doses of less than 0·5 g. daily it will probably be wise in most cases to discontinue the drug or to supplement it with other anticonvulsants, for in very resistant cases more satisfactory therapeutic results were obtained with fewer toxic effects by supplementary treatment with phenobarbital or bromides. Although the toxic symptoms do not seem to be dangerous, the small difference between the therapeutic and toxic doses calls for careful administration.

It is interesting to compare the pharmacological actions of sodium diphenyl hydantoinate with those of the other anticonvulsants. It has been shown that with sodium diphenyl hydantoinate a great reduction in the number of fits is sometimes accompanied by isolated outbursts of severe attacks. The optimum therapeutic dose closely approaches the toxic, and fits do not occur at all when toxic symptoms are present. It seems, in fact, that the anticonvulsant effect is a close precursor of the toxic in some cases. Further, the drug has little or no depressant action on the nervous system. These observations suggest a completely different anticonvulsant effect from the bromides or barbiturates, for these substances seem to control epilepsy in virtue of their depressant action on the central nervous system.

It may be that whereas the bromides modify the response of the nervous system to the factor initiating a convulsion the hydantoinate suppresses this cause without modifying nervous activity. If so the hydantoinate would be producing its effect at an earlier stage in the epileptic process. When the cause of the convulsions reaches dimensions too great to be controlled by hydantoinate, however, it seems to activate a completely undepressed nervous system, and so causes a maximal response.

SUMMARY

Ninety-one chronic epileptics who had ceased to respond to other anticonvulsants were treated with sodium diphenyl hydantoinate. The patients all lived at home and had been under regular observation and treatment with other drugs for an average of 6·4 years. The trial period ranged from 6 weeks to 10 months (average 4·1 months).

The fits were reduced in frequency in 79 per cent. of the subjects with grand mal and 63 per cent. of those with petit mal. In 19 per cent. the improvement was dramatic and has been maintained for over 5 months. Toxic symptoms arose in 36 per cent. and two patients died in status epilepticus while receiving the drug.

The drug seems to be of value in the treatment of epilepsy in some cases when other forms of treatment have failed, but there are no indications that it should supersede the less toxic anticonvulsants in the initial stages of treatment. Its administration requires careful observation of the patient.

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CHEMOTHERAPY OF EXPERIMENTAL ANTHRAX INFECTION

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THE relative values of the various therapeutic agents, or surgical procedures, which have been used in the treatment of human anthrax infection are difficult to estimate since the conditions essential to satisfactory clinical trial are almost impossible to fulfil. The case-mortality in Great Britain from all forms of anthrax varied during the five-year periods between 1901 and 1930 from 10·5 to 29·6 per cent. Respiratory and alimentary anthrax are almost invariably fatal, while the mortality of the cutaneous form may vary from 3·3 to 24·3 per cent. (Legge 1934) according to the site of infection. The standard treatment in the past, apart from surgery, has consisted in the use of immune serum and arsenicals. There appears to be a consensus of opinion that each of these reagents has a therapeutic effect but the results are greatly influenced by the site of infection and the stage at which treatment is begun.

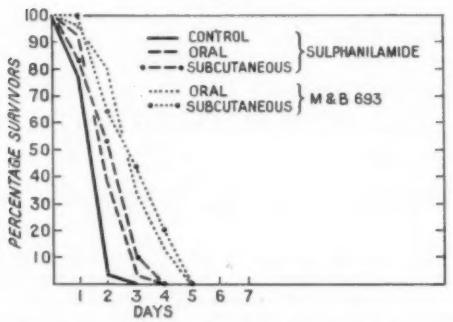
Sclavo (1903) reported that the mortality of a series of 164 cases in man treated with immune serum was 6·09 per cent. in contrast to the general anthrax mortality of 24·1 per cent. for all Italy during the same period, a comparison not free from possible criticism since other differential factors may have been present. Eurich (1933) uses both serum and Salvarsan in cutaneous anthrax and records a mortality of 5 per cent. in 200 cases but states that the relative value of the two substances is uncertain. Gilbert (1935), Spencer (1934) and many others report a high proportion of recoveries in cases treated with neoarsphenamine or other arsenicals. In the report (1935) on industrial anthrax of a committee of the American Public Health Association, in which various treatments are reviewed, it is concluded that the treatment of choice is immune serum, in default of which neoarsphenamine should be used, although it is again stated that the value of immune serum is not completely proved and that some deny its specificity. Other treatments which have been used are injections of peptone, of acriflavine and of copper sulphate, though there is no sound evidence that they are effective.

The success that has been achieved in the treatment of various bacterial infections with various sulphanilamide compounds clearly justifies their trial in anthrax infections; and such trials have probably

TABLE I—TREATED AND UNTREATED MICE SURVIVING AT SUCCESSIVE DAYS AFTER INFECTION

—	Day					
	0	1	2	3	4	5
Control (untreated) ..	30	23	1	0	0	0
Sulphanilamide (oral) ..	30	28	11	1	0	0
Sulphanilamide (subcut.)	30	25	16	3	0	0
M. & B. 693 (oral) ..	30	29	24	10	4	0
M. & B. 693 (subcut.) ..	30	30	19	13	6	0

FIG. 1



been made during recent years. I have not, however, been able to trace any published clinical records; and it is, in any case, desirable to assess the value of these drugs in experimental infections and under controlled conditions.

EXPERIMENTAL TECHNIQUE

The general plan of the experiments recorded in this paper was as follows.

The strain of *B. anthracis* used was obtained from the Ministry of Health laboratories through the courtesy of Dr. W. M. Scott. It had been isolated from horse-hair and was typical in its cultural and biochemical reactions. It was tested for virulence by the inoculation of 0·25 c.cm. of decimal dilutions in saline of a 24-hour serum broth culture subcutaneously in the left thigh of groups of mice. The larger doses killed all the mice in 24–28 hours and the dilutions chosen for the tests were of the order of 10^{-3} or 10^{-4} which killed the mice usually in 2–5 days. The inoculum of 0·25 c.cm. of the 10^{-4} dilution was found on plating to represent about 150 viable organisms. The infected mice developed a large inflammatory local lesion with œdema spreading up the flank and abdominal wall. The organism could be recovered in large numbers from the local lesion, spleen and heart-blood.

The mice weighed 20–26 *g.* and were of equal resistance in all groups, having come from the same stock and been fed on the same diet. All groups consisted of 30 or more mice.

Treatment with the various drugs was begun half an hour after infection and was usually continued for ten days. Cultures were made from the local lesion, spleen and heart-blood of the majority of the mice. The control mice invariably had intense *B. anthracis* septicæmia.

The object of the first experiment was to find out whether sulphanilamide or M. & B. 693 had any effect on the course of infection. Sulphanilamide was chosen as representative of the original products found effective in streptococcal and meningococcal infections, and M. & B. 693 as an example of those active in pneumonia and certain other infections. For oral administration the drugs were ground in a mortar and emulsified in water, then added to an equal volume of mucilage of tragacanth so that the required dose was contained in 0·5 c.cm. This was given directly into the stomach by means of a 1 c.cm. syringe fitted with a blunt-ended No. 19 needle. For subcutaneous injection the sulphanilamide was given in solution sterilised by autoclaving and the M. & B. 693 in the suspension in olive oil issued in ampoules by the manufacturers.

A total of 150 mice were infected with *B. anthracis* subcutaneously, and divided into five equal groups, of which one was kept as a control. The other groups received respectively throughout the experiment daily doses of 10 mg. of sulphanilamide by mouth; 10 mg. of sulphanilamide subcutaneously; 20 mg. of M. & B. 693 by mouth; and 20 mg. of M. & B. 693 subcutaneously. The larger dose of M. & B. 693 was given on account of its lower toxicity for mice, the average lethal dose being about 16·6 mg. per g. (Whitby 1938) as compared with 4 mg. per g. for sulphanilamide (Marshall 1939). For the mice used these toxic doses would be about 330–420 mg. and

FIG. 2

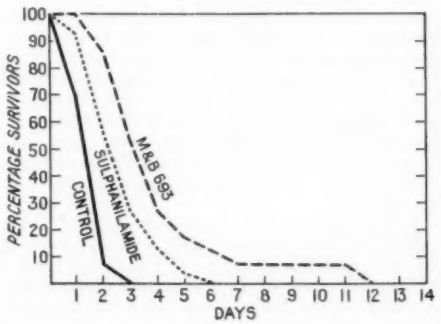


TABLE II—COMPARISON OF SURVIVAL TIMES WITH SULPHANILAMIDE AND M. & B. 693

—	Mice	Mean survival time (days)	Standard error
A. Control	30	1·27	0·102
Sulphanilamide ..	30	2·43	0·221
M. & B. 693 ..	30	3·80	0·443
B. Control	30	1·23	0·104
Sulphanilamide ..	30	2·87	0·213
M. & B. 693 ..	30	5·10	0·482

FIG. 3

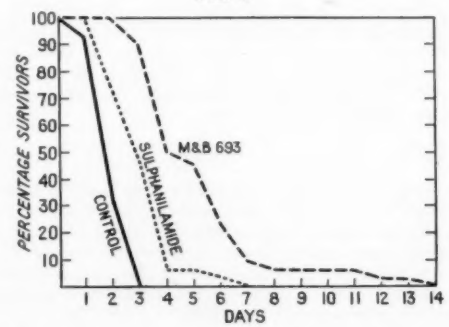


FIG. 4

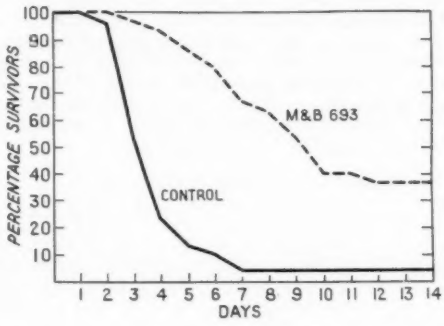
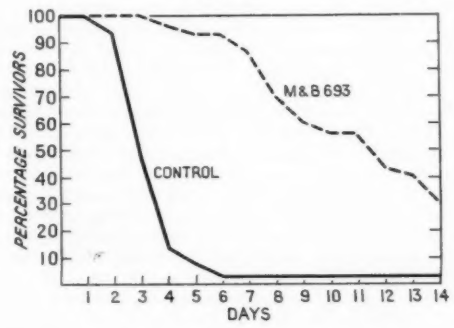


TABLE III—SURVIVAL WITH LARGE DOSES OF M. & B. 693

—	Mice	Percentage survivors	Standard error	Mean survival time limited to 21 days	Standard error
A. Control ..	30	3·33	3·276	3·63	0·598
M. & B. 693	30	36·67	8·798	12·00	1·228
B. Control ..	30	3·33	3·276	3·93	0·601
M. & B. 693	30	30·00	8·367	10·17	0·591

FIG. 5



80–100 mg. respectively. In this and in subsequent experiments a group of 8–10 uninfected mice received the same doses of the drugs as the infected groups and were observed for a few weeks afterwards in order to ensure that the drugs themselves did not have any injurious action on the mice.

The results are shown in table I and fig. 1. None of the mice survived beyond the fourth day after infection, but life was definitely prolonged in all groups receiving treatment. This is clearly shown by the figures recorded on the second day. It may be inferred therefore from this experiment that both sulphanilamide and M. & B. 693 have some effect in delaying death from anthrax infection. Further, there is no difference in the effect of oral and subcutaneous administration. In the doses employed, M. & B. 693 is more effective than sulphanilamide.

In the next experiment a 20 mg. dose of sulphanilamide or of M. & B. 693 was given by mouth twice daily as long as any mice survived, so that a direct comparison of the two drugs was possible. The same test was repeated and the results of the two experiments are recorded in table II (A and B) and in figs. 2 and 3. Although there were still no survivors at the end of fourteen days, the effect of treatment in delaying death is significant, and it is also evident that M. & B. 693 is more effective than the same dose of sulphanilamide.

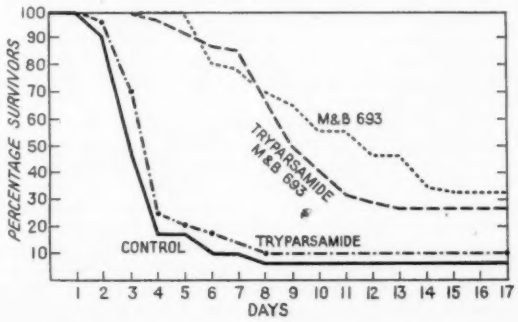
It was now desired to determine whether one could, by increasing the dose of M. & B. 693 to a very high level (100 mg. daily), bring about a significant survival-rate in the treated group. It was thought that the concentration of the drug in the blood might fall at some stage owing to the time elapsing between the night and morning oral doses. It was therefore decided to give 60 mg. by the oral route in two daily doses of 30 mg., and 40 mg. daily by subcutaneous injection. The oral treatment was continued for ten days and the subcutaneous injections for six days. This experiment was also repeated with a slightly different infecting dose (table III, A and B, figs. 4 and 5). In each test there was 1 survivor amongst the controls (3·33 per cent.) and there were 11 (36·67 per cent.) and 9 (30 per cent.) survivors in the treated groups. These differences are clearly significant, as are also the differences in the mean times to death of the control and treated mice. It may be stated that these large doses of M. & B. 693 did not appear to have any injurious effect on the mice, and there were no deaths in the uninfected group receiving the drug. In a proportion of the treated mice dying after the seventh day it was not possible to isolate *B. anthracis* from heart-blood, spleen or site of infection, and in many of them there was no sign of any local lesion. Œdema and redness at the site of infection were in fact rarely prominent in mice receiving M. & B. 693.

Since it was established that the life of infected mice could be prolonged by moderate doses of M. & B. 693 and about a third of the infected mice could be saved by larger doses, it seemed of interest to try the effect of large doses of arsenical compounds which from their reported success in human anthrax might be expected to influence the experimental infection, though the published records of previous tests in the experimental disease were not encouraging (Cambessedès and Reilly 1925, Stolygvo 1927, Urbain, Theobalt and Vallée 1930, Kurotchkin and Reimann

TABLE IV—SURVIVAL WITH LARGE DOSES OF M. & B. 693, WITH TRYPARSAMIDE AND WITH BOTH TOGETHER

—	Mice	Percentage survivors	Standard error	Mean survival time limited to 21 days	Standard error
Controls ..	30	6·67	4·55	4·27	0·821
M. & B. 693 ..	35	34·29	8·024	12·81	1·025
Tryparsamide ..	30	10·00	5·477	5·33	0·986
M. & B. 693 + tryparsamide	38	26·32	7·144	11·29	0·943

FIG. 6



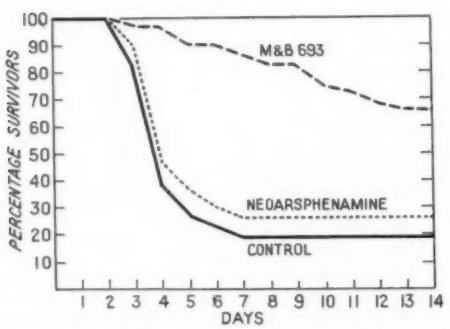
1930). Trial was first made of Tryparsamide (sodium N-phenyl glycineamide-*p*-arsonate). The maximum tolerated dose for a 20 g. mouse is given by Yorke, Murgatroyd and Hawking (1931) as 100 mg. It was determined that the mice used in the present trial would actually tolerate without ill effect the intraperitoneal injection of 20 mg. in 0·5 c.cm. of sterile distilled water daily over a period of ten days. This dose was therefore employed.

In table IV and fig. 6 are shown the results of treating groups of mice for ten days with M. & B. 693 (50 mg. twice daily by mouth), with tryparsamide, and with both simultaneously. There were 6·67 per cent. of survivors in the control group, 31·43 per cent. in the group treated with M. & B. 693, 10 per cent. in those treated with tryparsamide and 26·32 per cent. in those receiving both drugs. One may deduce from these figures and those for the mean survival times that tryparsamide is without action and does not enhance the effect of M. & B. 693, which is evident in the two groups receiving it.

TABLE V—COMPARISON OF SURVIVAL WITH M. & B. 693 AND WITH NEOARSPHENAMINE

—	Mice	Percentage survivors	Standard error	Mean survival time limited to 21 days	Standard error
Controls ..	30	20·00	7·303	7·00	1·24
M. & B. 693 ..	30	66·67	8·606	16·30	1·13
Neoarsphenamine	30	26·67	8·073	8·50	1·34

FIG. 7



Finally, a similar experiment was performed to determine the effect of neoarsphenamine (Neokharsivan, B. W. & Co.). This drug was shown to have an average lethal dose for 20 g. mice of about 5 mg. A dose of 1 mg. which was well tolerated by the mice was used in the test. It was given intraperitoneally in 1 c.cm. of sterile distilled water freshly boiled just before solution and injection of the drug. Another group of mice received M. & B. 693 by mouth in the same dosage as in the previous experiment. Treatment was continued for ten days. There were 30 mice in each group.

From the results which appear in table V and fig. 7, it will be noted that the mice received a rather smaller infecting dose than usual, and that 20 per cent. of the untreated mice survived. Of those treated with M. & B. 693, 66·67 per cent. survived, as compared with 26·67 per cent. of those treated with neoarsphenamine. It is thus clear that benefit has been conferred on the mice treated with M. & B. 693, and this is confirmed by the figures for the mean survival times. The effect of neoarsphenamine is entirely insignificant.

In all the foregoing experiments the mice were observed for twenty-one days, but deaths did not occur after the fifteenth day. In the last series the mice surviving on the twenty-first day, all healthy in appearance, were killed and cultures made on agar from the heart-blood and spleen. Half of the spleen was also taken into broth from which any growth after incubation was plated on agar. In no case was *B. anthracis* isolated from these mice.

DISCUSSION AND CONCLUSIONS

Of the agents tested only M. & B. 693 and sulphanilamide were found to have a beneficial action on the course of anthrax infection in mice, and of the two M. & B. 693 was more effective. The action of these drugs is not so dramatic as in streptococcal infection, but when very large doses of M. & B. 693 are given a considerable proportion of the mice survive and the curative effect is complete in the sense that the organism is not recoverable from the tissues of the mice. It is to be noted that the therapeutic doses are almost twice as large as those given by Schütze (1939) to mice in his study of plague infection. He found that a successful result was obtained by giving 80 mg. of M. & B. 693 along with the test dose and an estimated dose of 50 mg. daily which was taken with the food.

Since these mouse doses multiplied weight for weight would indicate an enormous dose of M. & B. 693 for man, the question arises as to whether any inference at all may be made from the experiments reported in regard to the use of the drug in human infections. It should, however, be noted that the experimental infection is far more severe than cutaneous anthrax in man. In all experiments but the last, all, or almost all, of the control mice died. In the last experiment, with a death-rate of 80 per cent. among the controls, the death-rate among the mice treated with M. & B. 693 was reduced to 33·3 per cent. The death-rate in cutaneous anthrax in man varies, as has been noted, between 3·3 per cent. and 24·3 per cent., and it seems at least possible that, with these milder infections, relatively smaller doses than those given in most of these experiments might have a considerable therapeutic effect. Moreover, it seems clear that M. & B. 693 has, in the mouse, a far more effective action than have arsenical compounds. Pending adequate clinical trials, it seems reasonable to conclude that the same may be true in human anthrax. Whether M. & B. 693 would exert any significant therapeutic effect in pulmonary anthrax is, of course, more doubtful; but in a disease which, untreated, appears to be uniformly fatal, it would clearly be justifiable to give unusually large doses.

Whether M. & B. 693 would enhance the effect of a specific antiserum, or how it would compare with such a serum as a therapeutic agent, are questions that must await both animal experiments and adequate trials in man.

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ACTION OF THE SULPHONAMIDES IN EXPERIMENTAL ANTHRAX

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Although drugs of the sulphonamide class have now been shown to be effective against a number of pathogenic bacteria besides *Streptococcus pyogenes*, no information is available as to their efficacy in anthrax infections. This investigation was undertaken to find out whether there is any experimental evidence in favour of applying these drugs to human anthrax, how they compare in efficacy with commercial and other anti-anthrax sera, and whether they exert any synergic action with anti-serum as they do in infections due to the pneumococcus and *Str. pyogenes*.

TECHNIQUE

The strain of *B. anthracis* used throughout was isolated from a vesicle in a case of cutaneous anthrax in an artificial-manure worker. It was passed repeatedly in mice until its virulence for this animal had become constant; at this stage a dose of approximately 30 bacilli injected intraperitoneally killed 90 per cent. of the mice in 4 days. Heart's blood was used for passage, the inoculations being made subcutaneously; throughout the investigation the strain was maintained in mice and not in artificial culture. In this way its virulence for the mouse was kept more or less constant.

Most investigators, such as Sterne (1937b) and Ivanovics (1937), have used fractions of an agar slope as an indication of dosage. It was decided that this was too indefinite and that the approximate number of organisms used should be known. Sterne (1937a) showed that capsulation of anthrax bacilli could be obtained on artificial media if the carbon-dioxide concentration of the atmosphere in which it was incubated was raised to between 50 and 60 per cent. This was confirmed using 14 per cent. serum-agar slopes and 5 per cent. rabbit blood-agar slopes. However, it was found impossible to prevent spore formation under these conditions and it is well known that a proportion of relatively avirulent variants can be produced from a virulent strain even on first subculture on an artificial medium. It was decided therefore to use the peritoneal exudate of a mouse dead overnight from intraperitoneal infection with anthrax. A tenth of a 16-hour agar slope culture made from the passage strain was injected intraperitoneally and the peritoneal exudate washed out with 10 c.cm. of broth on the following morning. The presence of a pure suspension of capsulated non-sporing anthrax bacilli was confirmed by microscopic examination. Ten-fold dilution of the exudate were prepared and 0·5 c.cm. of each dilution used with 10 c.cm. of agar as a poured plate for a viable count. It was found that in the peritoneal exudate chains of bacilli very rarely occurred; usually the bacilli were single or in pairs and the viable counts for successive dilutions gave approximately ten-fold diminution in colony counts.

Sulphonamide-P (B. W. & Co.), M. & B. 693 and 4 : 4 diaminodiphenyl-sulphone glucoside were used. We are indebted to Dr. G. M. Findlay for a supply of the last preparation. Suspensions of the first two compounds were prepared in equal parts of water and mucilage of tragacanth; the sulphone was dissolved in water; all these were given by mouth except for one experiment in which M. & B. 693 was given subcutaneously as well as by mouth. The doses of sulphonamide and M. & B. 693 were probably only accurate to ± 10 per cent. owing to the difficulty of obtaining a homogeneous stable suspension. The preparations were administered 4 hours before infection and thereafter at 24 hour intervals. Sera were given intraperitoneally in a single dose of 0·5 c.cm. 4 hours before infection. In each experiment twelve mice were treated with the drug and twelve untreated served as controls. Six mice in each group were infected with approximately 300 organisms intraperitoneally in 0·5 c.cm. of broth and the other six received approximately 30 organisms in the same volume.

Table I—Results with three sulphonamide drugs

Drug	Dose	Total dose	Infecting dose; number of organisms	Treated mice † dead at end of—		Control mice † dead at end of—	
				2nd day	4th day	2nd day	4th day
Sulphonamide-P (B.W.)	20 mg. in each of 3 doses	60 mg.	30	1	3	3	6
			300	2	5	2	5
M. & B. 693	40 mg. in each of 2 doses.	80 mg.	15	0	6	3	5
			200	0	5	5	6
	60 mg. by mouth, 3 doses + 60 mg.*	240 mg.	29	0	5	3	6
			280	1	6	6	6
Sulphone	20 mg., 2 doses	40 mg.	35	0	4	2	6
			400	2	4	3	6

* In olive oil subcutaneously one dose.
† Each group consisted of six mice. All mice died by 6th day.

RESULTS

The results of experiments with the three drugs are given in Table I.

The following sera were tested:

(1) Sclavo's.
(2) Mulford's.
(3) Serum from a patient recovered from a natural infection with anthrax, the serum being collected three weeks after infection.
(4) A rabbit immune serum prepared by giving twelve weekly intravenous injections of the whole of a mouse peritoneal washing, sterilised with 0·5 per cent. formalin and kept at 0° ± 4° C. till sterile. This was a fully capsulated bacterial vaccine. This serum precipitated the "P" substance of the anthrax

Table II—Protective action of various anti-anthrax sera

Serum	Infecting dose; number of organisms	Treated mice * dead on—		Control mice * dead on—	
		2nd day	4th day	2nd day	4th day
Sclavo's ..	45	3	6	5	6
	300	6	6	4	6
Mulford's	80	0	5	2	5
	400	6	6	5	6
Human convalescent	20	0	4	4	6
	350	2	5	4	6
Rabbit immune	20	0	2	5	6
	250	0	1	5	6

* Each group consisted of six mice.

capsule, a polymer of d(−) glutamic acid (Ivanovics and Bruckner 1938, to a titre of 1/1000. The sera were given in 0·5 c.cm. doses intraperitoneally 4 hours before infection. In the test of each serum twelve mice were treated while twelve untreated animals served as controls. The infecting doses were the same as in the experiments with the drugs. The findings in these experiments are recorded in table II.

The three remaining mice in the experiment with patient's serum and the nine remaining mice in the experiment with rabbit serum all survived.

Two experiments were carried out with a combination of M. & B. 693 and serum, 0·5 c.cm. of serum being given intraperitoneally 4 hours before infection and 40 mg. of M. & B. 693 by mouth in each of the doses, the first 4 hours before infection and the second 24 hours later. The results are summarised in table III.

TABLE III—COMBINED EFFECT OF DRUG AND SERUM

Serum	Infecting dose	Treated mice dead on—		Control mice dead on—	
		2nd day	4th day	2nd day	4th day
Human convalescent + M. & B. 693	30	0/3	1/3 *	2/3	3/3
	200	0/3	1/3 †	2/3	2/3
Immune rabbit serum + M. & B. 693	30	0/5	0/5	5/5	5/5
	250	0/5	4/5	5/5	5/5

* 2 more died on 5th day. † 1 died on 5th day.

DISCUSSION

Although there is no evidence from these experiments that any of the three chemotherapeutic preparations—sulphonamide, M. & B. 693, sulphone glucoside—had any effect, in the dosage employed, on the ultimate outcome of infection in mice with *B. anthracis*, there is some indication that the drugs were not entirely without effect. The findings at the end of 2 days showed fewer deaths among the treated mice than among the controls. And, although these differences were not sufficiently great to be significant in the case of the groups treated with sulphonamide and the sulphone, in the case of the mice treated with M. & B. 693 the differences appear to be significant. At the end of 2 days, in the first experiment with M. & B. 693, when eight out of twelve control mice were dead, all the twelve mice treated with M. & B. 693 were alive and apparently well. This suggests that M. & B. 693 had the effect of holding up temporarily the course of the infection.

With the two commercial sera most commonly used in this country there was no difference at any stage of the experiments between treated and control animals; similar findings have also been obtained by Tomcsik and Ivanovics (1938) with the sera commercially available in Hungary. The serum prepared in the rabbit, however, saved nine out of twelve mice. Since it has been show by Ivanovics (personal communication) that anti-anthrax sera capable of protecting mice may be ineffective in guineapigs and rabbits, it by no means follows that a serum conferring no protection on the mouse would be valueless in the treatment of human anthrax. Clinical experience has in fact shown (Eurich 1927, Hodgson 1928) that Sclavo's serum does exert a beneficial effect on anthrax infections in man.

The main object of these experiments with anti-anthrax sera in mice was to find out whether, with a serum protective for this animal, there is any synergic action between serum and drugs of the sulphonamide group such as has been shown for antipneumococcal sera and M. & B. 693 by Fleming (1938) and for anti-streptococcal serum and sulphanilamide by Loewenthal (1939). No such complementary action could be demonstrated, for the results obtained with the anti-anthrax rabbit serum together with M. & B. 693 were no better than with serum alone. Although there is no clear indication from this work that drugs of the sulphonamide group would be a useful adjunct to serum in the treatment of human anthrax, the fact that they, and M. & B. 693 in particular, were apparently able to hold up temporarily a rapidly invasive infection suggests that they might be of some service. Actually, while these experiments were being carried out, 2 cases of severe cutaneous anthrax were treated with M. & B. 693 and Sclavo's serum. Though both recovered, it cannot justifiably be claimed that the use of the drug played any material part in overcoming the infection.

SUMMARY

(1) M. & B. 693 and to a less extent sulphanilamide and sulphone delay death in mice infected with fully virulent capsulated non-sporing anthrax bacilli.

(2) No ultimate decrease in mortality is found by using these drugs.

(3) Two commercially available sera commonly used have no protective action for mice.

(4) The findings of Ivanovics and Bruckner, that an anti-anthrax serum prepared in the rabbit exerts a high degree of protection in mice, have been confirmed.

(5) There is no apparent increase in the protective action of serum in mice by using it in combination with M. & B. 693.

We are indebted to Prof. S. P. Bedson and Dr. P. N. Panton for help and encouragement, and to Dr. G. Ivanovics for supplying some purified " P " substance of the anthrax capsule.

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COMPLETE HEART-BLOCK IN YOUNG PEOPLE

REPORT OF TWO CASES

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CASES of complete heart-block in children and young people have been recorded by Archigène in 1927 (39 cases); Yater in 1929 (30 cases of congenital block); Wood and Rogers in 1932 (6 cases of congenital block); Sprague and White in 1927 (11 cases of juvenile block); Perry in 1931 (3 cases in children, 2 the result of rheumatic heart disease and 1 a sequel of an attack of diphtheria, all leading normal school lives); and Campbell and Suzman in 1934 (8 cases of congenital complete block, 7 living normal lives, 1 died of rheumatic complications). Lemann, in a review of the literature in 1933, stated that heart-block was congenital in 42 of the approximately 100 published cases.

The first case reported here was evidently the result of a severe measles infection. All the acquired

cases of persistent heart-block in children due to infection are said to result from influenza, diphtheria, and rheumatic fever; this seems to be the first one reported as the result of measles. The second case had severe measles at the age of three, and malignant influenza in 1918 at the age of five, so there was a source of infection which might have caused the heart-block. Otherwise, it must be considered as congenital. A point of interest in this case is the high ventricular rate after exercise and injection of atropine gr. 1/33. After exercise the ventricular rate increased from 50 to 80, the auricular rate from 90 to 100. After atropine the ventricular rate increased from 50 to 80, the auricular rate from 90 to 110.

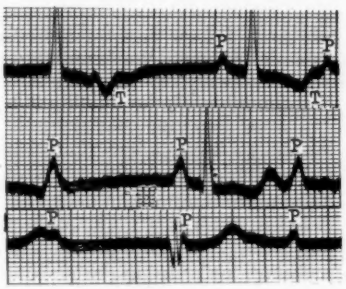

FIG. 1 (case 1)—Complete heart-block. Ventricle 50, auricle 70. T wave inverted in lead 1.

Liljestrand and Zander (1927) investigated a case, a young man of twenty-one who was able to take part in strenuous games and to swim "for as long as he liked." His ventricular rate increased up to over 100 with strenuous exercise. Aitken (1932) reported two cases after injection of atropine gr. 1/75. In the first the ventricle increased from 62 to 94, and the auricle from 100 to 150. In the second the ventricle increased from 55 to 83, and the auricle from 100 to 137. Atropine has been shown to produce similar effects in other cases, but in some there has been no response at all.

FIG. 2 (case 1)—After 20 hops before each lead. Ventricle 50, auricle 110.

CASE 1.—A boy aged thirteen, with heart-rate 56 per min. At the age of three he had severe measles and is said to have nearly died. His doctor noted a murmur over the heart. He was kept very quiet for a long period, and as he seemed well was allowed gradually to take more exercise. By the time he went to his preparatory school he was able to play games and run without fatigue. At the age of thirteen, during an attack of influenza, the school doctor noted that there was a marked systolic murmur over the cardiac area.

On examination he is a very active boy, thin and excitable, but looks healthy. Heart-rate regular, 56 per min. Apex-beat inside the midclavicular line, and area of cardiac dullness normal. All the sounds are accentuated. The first sound at the apex and the pulmonary second are more accentuated but clear. There is a harsh systolic murmur best heard over the pulmonary area and audible down to the apex, both on standing and lying. Blood-pressure 130/90. Radiography shows enlarged right auricle, beating 2 beats to 1 of the ventricle. Exercise-tolerance: 56 per min. before exercise, 60 after 20 hops, and 56 after resting two minutes; response is good, with no dyspnœa (see figs. 1 and 2).

CASE 2.—A youth aged nineteen, with heart-rate 50 per min. At the age of three he had severe measles, but was not dangerously ill. In 1918 at the age of five he had severe influenza of the malignant type which was then prevalent. In 1927 at the age of fourteen his doctor accepted him on the "club." In 1931 at the age of eighteen the same doctor attended him for pyrexia for a fortnight, and noting a murmur told him that his heart was wrong and he must lead a quiet life. No details are available from his doctor as he has since died. The young man has no shortness of breath and can cycle a 100 miles in a day with ease.

On examination he looks healthy. Heart is not enlarged, the apex-beat being inside the mid-clavicular line and the area of cardiac dullness normal. The sounds are clear. There is a slight systolic murmur over the pulmonary area on standing, which on lying becomes louder and harsher, extending over the aortic area and up to the left clavicle. Blood-pressure 155/85. Heart normal radiographically. Exercise-tolerance: 50 per min. before exercise, 80 after 20 hops, and 50 two minutes after exercise; response good, with no dyspnœa (see figs. 3, 4 and 5).

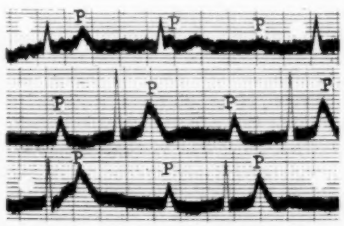

FIG. 3 (case 2)—Complete heart-block. Ventricle 50, auricle 90.

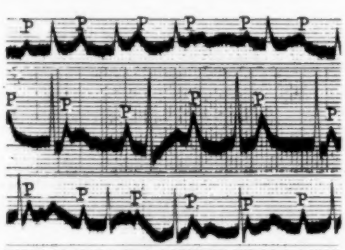

FIG. 4 (case 2)—After 20 hops before each lead. Ventricle 80, auricle 100.

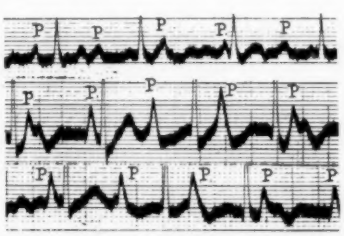

FIG. 5 (case 2)—After injection of atropine gr. 1/33. Ventricle 80, auricle 110.

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STILBŒSTROL AND ANHYDRO-OXYPROGESTERONE

THEIR EFFECTS ON MENSTRUATION AND LACTATION

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AND

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SINCE Cook, Dodds, Hewett, and Lawson (1934) reported the œstrogenic activity of synthetic compounds containing the phenanthrene ring, many attempts have been made to discover other compounds with similar properties.

Dodds and Lawson (1937) showed that *p*-hydroxypropenyl-benzene, or anol, a relatively simple chemical compound containing only one benzene ring, exerted in castrated rats an œstrogenic effect similar to that of œstrone. A further compound, 4 : 4′-hydroxydiphenyl- α : β diethylstilbene, containing two benzene rings and discovered by Dodds, Golberg, Lawson, and Robinson (1938) was found to have a high œstrogenic activity both on oral and on parenteral administration. Fierz-David, Jadassohn, Uehlinger, and Monnier (1938) and several other investigators have fully confirmed the œstrogenic properties of this compound, which has been named stilbœstrol by Dodds.

In the reports of animal experiments with stilbœstrol there is a unanimity of opinion on the qualitative identity of its actions with those of œstrone, although there are considerable quantitative differences.

Kreitmaier and Sieckmann (1939) found stilbœstrol to be twenty times more active than œstrone and five or six times more active than œstradiol benzoate given by mouth. There is not yet complete agreement with regard to its toxicity towards animals. Whereas Kreitmaier and Sieckmann say that doses of 300 mg. administered subcutaneously to a small dog produced no secondary symptoms, Loeser (1939a) found injurious effects on the adrenals and liver after large doses.

According to Loeser (1939a) stilbœstrol injected into the uterus does not stimulate the thyroid gland, whereas œstrone does. Loeser suggests that this distinction may constitute a test for differentiating between endogenous and foreign œstrogenic substances.

The œstrogenic properties of stilbœstrol have also been confirmed in clinical studies.

Guldberg (1938) induced menstruation in a castrate after the administration of a total of 20·25 mg. and subsequent treatment with corpus-luteum hormone. Engelhart (1938) obtained the same result with a total of 28 mg. in seven intramuscular injections.

Other writers, including Loeser (1939b), Winterton and MacGregor (1939), and Bishop, Boycott, and Zuckerman (1939), emphasise that the action of stilbœstrol is the same as that of the natural œstrogens, in that it can (1) induce a proliferation of the endometrium, (2) abolish deficiency manifestations of the climacteric, (3) stimulate the growth of a hypoplastic uterus, (4) abolish the pains of dysmenorrhœa, and (5) prevent or inhibit lactation (Buschbeck and Hausknecht 1939, Lindemann 1939).

Divergent views have been expressed with regard to the occurrence of secondary symptoms.

Buschbeck and Hausknecht (1939) found variations in tolerance to the drug, some patients tolerating as much as 21 mg. daily, and others experiencing lassitude and vomiting with small doses. Some women tolerated injections but not tablets, and vice versa. Ehrhardt, Kramman, and Schäfer (1939) describe similar phenomena.

Although all authors agree about the similarity of the properties of stilbœstrol to those of the follicle hormone, emphasis is constantly laid on the yet unresolved question of dosage. We accordingly sought to ascertain :—

(1) The minimal dose necessary to produce proliferation in a resting or atrophic endometrium.

(2) The dose necessary to induce a hyper-proliferation (in the sense of glandular cystic hyperplasia).

(3) The doses necessary to prevent and to inhibit lactation in the puerperium.

At the same time we sought to ascertain the dose of corpus-luteum hormone (anhydro-oxyprogesterone) given by mouth necessary to produce the stage of transformation of the endometrium with subsequent menstruation.

Observations on Castrated Women

We investigated 9 women who had for various reasons (mostly menorrhagia) been castrated with X rays two or three years ago when they were over 45. One of them was a woman, aged 63, whose menopause had occurred thirteen years ago.

In each woman three trial curettages were carried out: (1) before treatment; (2) after administration

FIG. 1—Curette designed by Dr. Karl Joël, showing interchangeable cutting edges.

of stilbœstrol; and (3) after administration of anhydro-oxyprogesterone. We wished by this means to determine histologically at each stage the effect on the endometrium. At the same time a portion of the material obtained was examined for its glycogen content.

We used a curette (fig. 1) designed by one of us (K. J.) and made by Laubscher and Co., Basle. It has the advantage that it can easily be introduced, after passing a sound, without dilatation of the cervix and has exchangeable cutting edges and is therefore always freshly sharpened.

ILLUSTRATIVE CASES

The following is a brief account of 2 of the 9 cases investigated.

CASE 1.—The patient, aged 54, had been castrated with X rays in 1937 because of climacteric hæmorrhages. She had leucoplakia and vulval pruritus and kraurosis, with intense pain. She was not curetted at the start of treatment. She was given stilbœstrol 10 mg. (two tablets of 5 mg.) on Feb. 17, 20, 23, 25, and 27, 1939, making a total dose of 50 mg. She was also given by mistake œstradiol (Ovocyclin) 5 mg. on March 1. On March 3 (the fifteenth day of the menstrual cycle) there was improvement as regards hot flushes, but the leucoplakia remained unchanged. She was curetted, a sound being passed a distance of 8 cm. The ducts of the glands showed partial development of cysts of various sizes, the stroma was loosened, and occasional hæmorrhages were seen. No glycogen was found. Glandular cystic hyperplasia was diagnosed (fig. 2).

From the 3rd to the 12th she was given anhydro-oxyprogesterone 10 mg. (Lutocyclin, two tablets of

5 mg.) daily, making a total dosage of 100 mg. From the 12th to the 15th there was hæmorrhage. On the 13th (the twenty-fifth day of the cycle) curettage showed the presence of glycogen and hæmorrhagic stroma—a stage partly of secretion and partly of glandular cystic hyperplasia.

A second course of treatment followed, the patient receiving an intramuscular injection of stilbœstrol 3 mg. on March 13, 17, 21, 24, and 27, making a total dosage of 15 mg. Curettage on the 27th (the fourteenth day of the cycle), when a sound was passed for a distance of 9 cm., showed a stage of proliferation (fig. 3), without any glycogen. From March 28 to April 8 the patient received anhydro-oxyprogesterone 25 mg. (five tablets of 5 mg.) daily, making a total dosage of 300 mg. From the 9th (the twenty-seventh day of the cycle) to the 13th there was fairly intense hæmorrhage. Curettage on the 11th (the twenty-ninth day of the cycle), when a sound was passed for a distance of 8·5 cm., showed menstrual desquamation and hæmorrhages, and occasional glands showed alteration of secretion and the presence of glycogen.

CASE 2.—The patient, aged 48, had been castrated with X rays in 1936 because of climacteric hæmorrhages. On Feb. 13, 1939, curettage, when a sound was passed for a distance of 7 cm., showed atrophy of the mucosa. The patient was given stilbœstrol 5 mg. (one tablet) on Feb. 13, 15, 18, 21, 23, 25, and 27, making a total dosage of 35 mg. On the 28th (the sixteenth day of the cycle) there was some discharge. Too little material was obtained by curettage for histological examination.

From March 1 to 10 the patient was given anhydro-oxyprogesterone 10 mg. (two tablets of 5 mg.) daily, making a total dosage of 100 mg. Curettage on the 11th (the twenty-eighth day of the cycle), when a sound was passed for a distance of 8 cm., showed a stage of transformation, with loose stroma and an abundance of vessels arranged typically. There were definite deposits of glycogen in the epithelium and in the lumina of the glands. There was no hæmorrhage.

A second course of treatment followed, in which the patient received stilbœstrol 5 mg. (one tablet) on the 11th, 14th, 17th, 20th, and 23rd, making a total dosage of 25 mg. Curettage on the 24th (the fifteenth day of the cycle), when a sound was passed for a distance of 10 cm., showed a stage of proliferation, with the typical appearance of the glands and without glycogen.

From March 25 to April 5 the patient was given anhydro-oxyprogesterone 25 mg. (five tablets of 5 mg.) daily, making a total of 300 mg. On April 2 (the twenty-fourth day of the cycle), after she had received altogether 220 mg. of anhydro-oxyprogesterone, hæmorrhage appeared and continued until the 6th (the twenty-eighth day of the cycle), when curettage (a sound being passed for a distance of 10 cm.) showed a stage of transformation, with abundant glycogen and with longitudinal extension of the glands (fig. 4). On the same day the hæmorrhage ceased, except for a slight amount which continued until the 10th.

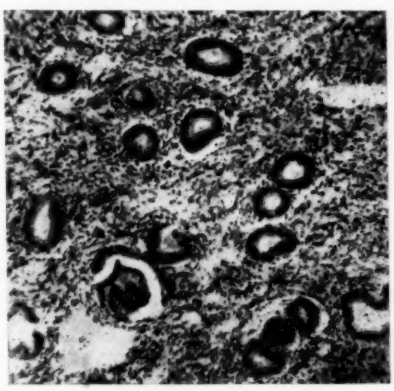

FIG. 3 (case 1)—Proliferation of endometrium after administration of stilbœstrol 15 mg. by intramuscular injections over a period of fifteen days (second course of treatment).

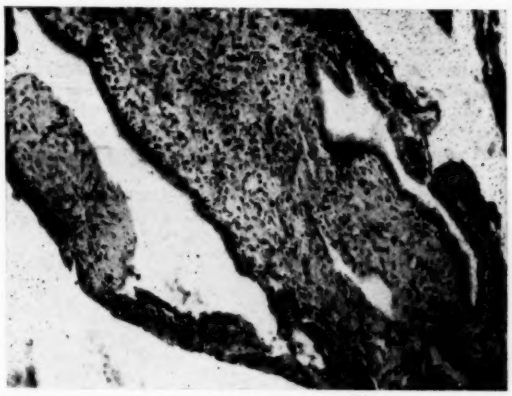

FIG. 2 (case 1)—Glandular hyperplasia of endometrium after administration of stilbœstrol 50 mg. by mouth over a period of fifteen days (first course of treatment).

EFFECTS OF STILBŒSTROL

At first our doses of stilbœstrol were too high. We were led into this error by the high dosage of the tablets and by earlier experience with follicle hormone, which is less efficacious by mouth in a proportion of about 1 : 5 (Zondek 1929). With 50 mg. we produced on three occasions a glandular cystic hyperplasia, which was histologically demonstrated. In two other cases, in which 50 and 60 mg. were given, curettage could not be performed owing to the illness of the women (influenza epidemic), and we cannot therefore say anything with certainty about the condition of the endometrium. On the basis of this experience we gave a second course of treatment to five women and produced a stage of proliferation with a dose of 25 mg.—i.e., with five tablets of 5 mg. We may accordingly infer that the necessary dose for bringing an atrophic or a resting endometrium to the stage of proliferation is 25 mg. of stilbœstrol in tablet form. A dose of 50–60 mg. will probably produce a glandular cystic hyperplasia. By intramuscular injection 15 mg. is sufficient, as we demonstrated in two cases.

Besides the effect on the endometrium an effect on the myometrium was also demonstrated, similar to that already described by others (Buschbeck and Hausknecht 1939, Winterton and MacGregor 1939, Ehrhardt et al. 1939, Bishop et al. 1939). In all our cases an increase of 1–1·5 cm. in the distance for which a sound could be passed was observed after the administration of stilbœstrol.

Headache, hot flushes, pruritus vulvæ, slight leucoplakia, and in one case neuritis were strikingly mitigated. Only in two cases did the patient complain of fatigue, general weakness, and nausea. In one case there was vomiting. These secondary symptoms were, however, only fleeting and disappeared after a few days. The women have remained under our observation up to the present time and have had no return of the trouble.

EFFECTS OF ANHYDRO-OXYPROGESTERONE

Anhydro-oxyprogesterone was given by mouth after a stage of proliferation of the endometrium had

been produced with stilbœstrol. After using too little doses at first through lack of experience, we were able, by gradual increases, to ascertain the amount necessary to produce the stage of transformation with accompanying menstruation. We gave at first 50–60 and 100 mg. in two cases in which too much stilbœstrol had previously been administered. In these two cases, after this relatively small quantity

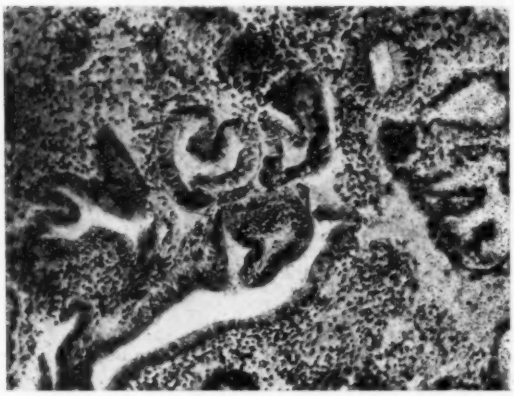

FIG. 4 (case 2)—Transformation of the endometrium after administration of anhydro-oxyprogesterone 300 mg. by mouth over a period of twelve days (second course of treatment).

of anhydro-oxyprogesterone, a hæmorrhage appeared. Examination of the endometrium, however, showed that there was a partial transformation and a slight amount of glycogen present, with glandular hyperplasia. In two cases in which too much stilbœstrol had not been given no hæmorrhage appeared. Only in the case of the patient aged 63 was a hæmorrhage, which we must describe as menstruation, produced with 90 mg. We obtained genuine menstruation after complete transformation of the endometrium and with a positive glycogen content with 200 mg. once, 220 mg. twice, and 300 mg. twice. On the strength of these five cases, confirmed histologically, we may infer that the dose of anhydro-oxyprogesterone by mouth necessary for the transformation lies between 220 and 300 mg. The case in which a menstrual hæmorrhage appeared after 90 mg. we must regard as exceptional, and we must also assume that individual fluctuations will always appear.

We accordingly recommend that a dose of 300 mg. by mouth should be considered as the transformation dose. When we compare this dose with that which is required in the case of injection of corpus-luteum hormone, which amounts to 40–50 mg. (Zondek 1935) or 60 mg. (Clauberg and Uestün 1938), we have a proportion of 1 : 5 to 1 : 8. Oral medication has several advantages and was always tolerated without the production of any secondary symptoms, even in elderly women taking five tablets daily.

These doses of stilbœstrol and anhydro-oxyprogesterone must be regarded as maximal doses, for all our experiments were made on castrated women with an atrophic endometrium. It is therefore possible, in the case of a resting endometrium, to produce a true menstruation with 25 mg. of stilbœstrol and 300 mg. of anhydro-oxyprogesterone by mouth.

Effects of Stilbœstrol on Lactation

Published reports have made it clear that the administration of the follicular hormone during the puerperium inhibits lactation. The mechanism of this action is explained thus: the follicle hormone prevents the secretion by the anterior lobe of the hypophysis of lactotrophic hormone, which normally first appears in the puerperium. Several authors have succeeded, with various doses of follicle hormone (5–25 mg.), in either preventing the influx of milk or inhibiting lactation which had already begun. In the light of these observations we used stilbœstrol for the same purpose.

In 6 cases stilbœstrol was administered on the first day after confinement to prevent the secretion of milk. These cases comprised 4 stillbirths, 1 tuberculous patient forbidden to suckle, and 1 multipara with depressed nipples who had never been able to suckle. In 3 cases stilbœstrol 5 mg. (one tablet) was given in the first twenty-four hours after confinement; in the 3 others 10 mg. (two tablets) was given in one dose. In all cases the treatment was successful, no milk was secreted, and the breasts remained flaccid.

In 14 cases stilbœstrol was given to inhibit established lactation. The indications were hypogalactia, bleeding fissures, mastitis, eczema of the breasts, and tuberculosis. In 6 of these cases only 5 mg. (one tablet) was given, and the secretion of milk was completely arrested. In 2 of the women, however, the breasts were already flaccid and the secretion very meagre; the result must therefore be judged with caution. In 4 cases 10 mg. (two tablets) was given in one dose with good results. In 2 other cases the secretion of milk was arrested after the administration of 5 mg. (one tablet), but after one or two days the breasts again became somewhat distended, whereupon another 5 mg. (one tablet) was administered, and the milk secretion was finally arrested, the breasts remaining flaccid. In the remaining 2 cases the result was not so striking. In the first it was not possible to arrest the secretion of milk with 10 mg. by mouth, and it ceased only after the additional intramuscular injection of œstradiol dipropionate 10 mg. (ovocyclin P). In the second case the secretion decreased after the administration of 10 mg. but did not entirely cease. Complete inhibition was obtained after the administration of a further 5 mg. by mouth. All the women took stilbœstrol without difficulty, and no secondary symptoms were observed.

Our results show that the oral administration of stilbœstrol can prevent or arrest lactation. Doses of 5–10 mg. are sufficient, if given immediately after confinement, to prevent the secretion of milk with the greatest certainty. There is no need either to bind the breasts or to give aperients, and the pain from distension, which may be so distressing, does not occur. For arresting lactation which has already set in 5–10 mg. is also sufficient in most cases, though in some cases larger doses were necessary (not more than 20 mg.). The results are also very good, though not so striking and certain as in the prevention of lactation.

From the foregoing considerations it is clear that stilbœstrol is a cheap substitute for follicle hormone, which is particularly efficacious when given by mouth and appears to be indicated for the prevention and inhibition of lactation.

Summary

(1) The effect of stilbœstrol and anhydro-oxyprogesterone on a patient who had attained the climacteric thirteen years earlier and on 8 women castrated by X rays was studied, and the state of the endometrium was determined by curettage.

(2) For the proliferation of a resting or atrophic endometrium stilbœstrol 25 mg. by mouth or 15 mg. injected intramuscularly is required.

(3) With stilbœstrol 50–60 mg. given by mouth a glandular cystic hyperplasia can be produced.

(4) The stage of transformation and the menstruation following proliferation can be produced with anhydro-oxyprogesterone 220–300 mg. given by mouth.

(5) Only in 2 cases were slight secondary symptoms observed after the administration of stilbœstrol, but these rapidly disappeared. No secondary symptoms appeared after the administration of anhydro-oxyprogesterone in doses of 25 mg. (five tablets) daily.

(6) Lactation was either prevented or inhibited in 20 women by the administration of stilbœstrol 5–15 mg. by mouth. In most cases 5 mg. was sufficient.

We are indebted to Prof. Werthemann and Dr. Scheidegger, of the Pathological Anatomical Institute of Basle, for making the histological preparations, and to the Society of Chemical Industry in Basle (Ciba) and to the firm of Merck in Darmstadt for supplying us with their preparations.

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CLINICAL NOTES

INTUSSUSCEPTION OF THE APPENDIX

A REPORT OF TWO CASES

BY CECIL P. G. WAKELEY, D.Sc. Lond., F.R.C.S., F.R.S.E., F.A.C.S., F.R.A.C.S.

SENIOR SURGEON TO KING'S COLLEGE HOSPITAL; SURGEON TO THE BELGRAVE HOSPITAL FOR CHILDREN

ALTHOUGH intussusception of the appendix is well known, less than a hundred cases have been reported; but probably the incidence is greater than this would lead us to believe, for there must be many that come to operation and are not reported.

My first case was in 1919 and my second in 1938, an interval of twenty years. Both patients were children, and it is interesting to note that most of the recorded cases have been in young children. It seems probable that the same factors may be at work in the causation of intussusception of the appendix as are responsible for the enterocolic intussusception in infants. The most constant feature in these cases is the presence of enlarged glands in the root of the mesentery and in the ileocæcal angle. Also, there is a preponderance of lymphoid tissue in the terminal ileum and in the appendix. This increased lymphoid tissue acts as a foreign body and causes increased and irregular peristalsis of the bowel and appendix, which at times culminates in an intussusception. But this cannot always be the cause, for the condition has been seen in children up to the age of 10 and even in adults; Huddy (1927) records a case in a man aged 39. Sometimes a stercolith may be an exciting cause of the intussusception, and worms may play a part.

The histories of my two cases were as follows:

CASE 1.—A boy, aged 10 months, was admitted to hospital in June, 1919, because of screaming attacks and diarrhœa of some two days' duration. The child was well nourished and appeared contented. He allowed his abdomen to be palpated. A definite lump was felt in the right iliac fossa, and manipulation of it caused him to scream. The temperature was 100° F. and the pulse-rate 120.

Acute appendicitis was diagnosed and the abdomen opened under gas-and-oxygen anæsthesia through a muscle-split incision in the right iliac fossa. When the peritoneal cavity was opened, the cæcum was found to be hard, and, when this was delivered into the wound, only the tip of the appendix could be seen, the rest of it being invaginated into the cæcum (see figure). The terminal ileum was pulled downwards towards the tip of the appendix by the œdematous meso-appendix. An attempt to reduce the intussusception of the appendix was unsuccessful, for the peritoneal coat of the cæcum gave way in two places. An incision was therefore made into the caput cæci, and the intussuscepted appendix, together with a cuff of cæcum, was excised. The cæcal opening was then closed with a double layer of Lembert sutures. The child made an uninterrupted recovery and left hospital ten days after the operation.

The excised specimen consisted of an appendix completely intussuscepted except for its tip. The

Intussusception of the appendix: (A) external aspect; (B) on section. The terminal ileum is pulled down by the œdematous meso-appendix.

coats of the appendix were œdematous and infiltrated with blood, and the vessels in the meso-appendix were thrombosed.

CASE 2.—A boy, aged 5 years, was admitted to hospital in December, 1938, with diarrhœa and vomiting of four days' duration. The day before operation the doctor who was attending him noticed some blood and mucus in the stools and therefore suspected intussusception and recommended hospital treatment.

On examination the boy appeared anxious and was considerably dehydrated, having vomited several times the night before admission. On abdominal palpation a tender swelling could be felt in the right iliac fossa. Notwithstanding its tenderness it could be moved about the iliac fossa, and the question of

appendix abscess was therefore dismissed and colic intussusception diagnosed. Rectal examination gave a negative result. The pulse-rate was 100 and the temperature 100·6° F.

Operation was performed through a right paramedian incision, and the cæcum and terminal ileum were delivered through the wound. An intussusception of the appendix was discovered and was with difficulty reduced and the appendix excised, the stump being buried in the cæcum. The boy made an uninterrupted recovery and was discharged twelve days after the operation. The appendix was œdematous and its wall in places necrotic, and the vessels in the meso-appendix were thrombosed.

It is nearly a hundred years ago that McKidd reported a case, and it seems difficult to believe that fewer than a hundred have been reported since.

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DIFFUSE SCLERODERMA AND RAYNAUD'S PHENOMENON

FROM THE USE OF A PNEUMATIC HAMMER

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IN 1924, when he was 42, the patient, a foreman mason, first noticed numbness of the fingers of both hands during cold weather. He was then working in the United States, and had begun to use a compressed-air hammer the previous year. The instrument was held in the right hand and a chisel in the left. He continued to use the tool until 1930. Many of his mates had noticed similar symptoms and were annoyed by them, but nobody regarded the condition very seriously. When he returned to Scotland in 1934 he went on working as a mason, but not with a compressed-air tool. His hands still worried him in cold weather, but he noticed no other disability, except that the skin of the hands appeared to be getting thick, and there was some stiffness of the hands, which made flexion and extension of the fingers difficult. In January, 1939, he had a fall on the ice when he was watching some curling, and about a week later he found that the numbness of the fingers in the left hand was worse, and that the grip seemed weak.

Examination.—Now 57 years of age, he was a man of middle size with a high colour. The face was expressionless and immobile and the mouth small. The skin over the forehead and cheekbones and round about the mouth was tense, thin, and inelastic. With the utmost effort to open his mouth, the vertical aperture was not more than 1¼ in. The palpebral fissures of both eyes were small. There was diffuse thickening of the subcutaneous tissues in both hands, extending down the fingers, across the palm, and over the dorsum of the hand, which prevented closure of the fist and full extension of the hand.

All the fingers of both hands were pale. Lewis's hyperæmia test showed an abrupt cessation of flushing at the base of the palm and at the base of all five fingers on the dorsal aspect in both hands. Radial-artery pulsation was easily felt at the wrist in both hands. The blood-pressure in the right arm was 130/70; in the left arm the systolic pressure was 140, but no diastolic end-point could be obtained. All the fingernails and the toenails to a less degree showed a convexity in a longitudinal direction; there was moderate clubbing of all the fingers. The peripheral arteries in the legs (dorsalis pedis and posterior tibial) could not be felt. The tendon jerks were present in the arms and legs and there was no evidence of any sensory disturbance, nor of muscle weakness. The serum Wassermann reaction was negative. Radiograms of the hands showed slight "tufting" of the terminal phalanges only.

DISCUSSION

Scleroderma and Raynaud's phenomenon are commonly associated, and Raynaud's phenomenon is an occasional sequel to the use of pneumatic tools; but I can find no previous record of the two conditions developing together in a pneumatic-tool worker. The incidence of Raynaud's phenomenon in these trades is so high that individual susceptibility can play little part in its causation. To the vibration itself (aided by cold) one must ascribe the permanent changes produced in the vessels. Loriga (1929) says that permanent changes in the vessels resulting from the use of compressed-air tools are unknown, but this is not generally agreed, and Hunt (1936) finds no complete recovery from the Raynaud condition even when work is stopped for considerable periods. In the present case the question arises whether vibrations caused the scleroderma as well as the partial ischæmia of the fingers; or would the patient have developed these if he had never worked vibratory machines? Whatever the answer to this particular question, legislation to regulate the use of vibrating tools now seems to be overdue. For most trades tools have been devised which minimise the vibratory effects, and no others should be permitted.

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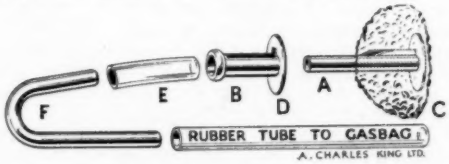
New Inventions

COMBINED SPONGE AND GAS-DELIVERY TUBE

I HAVE been using for the past few years the attachment illustrated here for prolonged administration of nasal gas for dental purposes. With this device gas is administered both through the throat sponge which is normally used by the dentist and through the nose by the orthodox nose-piece.



The figure is self-explanatory. The sponge (C) is held between the collar on the male tube (A) and that on the female tube (B). The rubber junction tube (E) fits over tube (A) jamming tube (B) into place. Induction is carried out in the ordinary way with a nose-piece. As soon as the patient is adequately anæsthetised, the damped sponge, ready mounted on the fitting and connected by rubber tubing to the gas apparatus, is pushed over the tongue and into the pharynx. It is then immaterial whether the patient breathes through the nose or mouth.

Since I have used this method I have had no difficulty in keeping any patient quiet for an indefinite time once I have succeeded in getting him really anæsthetised.

The fitting was made for me by Messrs. A. Charles King, 34 Devonshire Street, London, W.1.

W. H. MARSHALL, M.B. Camb.

MEDICAL SOCIETIES

BRITISH MEDICAL ASSOCIATION

SECTION OF NEUROLOGY AND PSYCHIATRY

WITH Dr. C. P. SYMONDS (London) in the chair, this section discussed

Symptomatic Headache

Prof. HENRY COHEN (Liverpool) suggested classifying the causes of pains in the head on an anatomical basis. Headache is incapable of quantitative assessment; we are therefore dependent on the patient's description of its site, duration, character, and intensity. Hence the patient's account of headache is often of little diagnostic value. Only a small number of those suffering from headache were victims of intracranial disease. Headache is the dominant symptom in "expanding lesions," meningeal irritation and diseases of the cerebral arteries. In adults, the more rapid the development and the earlier and more severe the interference with the circulation of the cerebrospinal fluid, the more intense is the associated headache. The dull, throbbing or bursting, splitting pain, aggravated by coughing, stooping, or straining, is associated with "expanding lesions." Pain beginning in the back of the head and radiating to the temples and frontal regions, accompanied by nuchal rigidity, is associated with meningeal irritation. The migrainous type of pain is commonest in vascular lesions. Yet all these types of headache have occurred in the absence of demonstrable cerebral pathology, suggesting that the essential mechanisms are functional and not dependent on an irreversible structural change. Intracranial origin is suggested not by a description of the headache but by associated signs and symptoms. The main factor in the mechanism of the pain is cerebral anoxia; benefit is frequently derived from the administration of oxygen.

Dr. DESMOND CURRAN (London) said that the diagnosis of functional headaches, which were now recognised to be so common, was apt only to be reached by a process of exclusion, on the principle that it was first necessary to eliminate all possible physical causes. The ruthless application of this principle could have the most unfortunate consequences; positive features should supplement the negative approach to the diagnosis.

The fallacies inherent in the classical antithesis between "functional" and "organic" might lead to the erroneous conclusion that a psychiatric problem was synonymous with a psychogenic problem. The head was not only something which was physically experienced but it was also something psychologically experienced as the place where our ego is localised. It was therefore easy to understand how any threat to the ego or personality was experienced subjectively as a head discomfort or a headache; and hence why head discomforts or headache should be such a frequent symptom in mental disorder.

The characteristic thing about a "functional" headache was its quality of closeness to as opposed to remoteness from the personality; it was not so much a typically sensory perception as an unpleasant experience with a special personal significance. This led to the rather special proprietory attitude of "*my* headache." The other characteristic features of the functional headache were the selective disturbance of function and its variability in accordance with psychological rather than physical events.

Much help might also be obtained from the study of the past history and personality of the individual concerned, and the presence of other symptoms of some psychiatric syndrome.

Dr. D. W. C. NORTHFIELD (London) said that the characteristic headaches usually caused by expanding intracranial lesions were not always accompanied by increased intracranial pressure; the pressure might in fact be abnormally low. The theory that headache was due to pressure on or tension of the dura mater could now be discarded. There was, however, much to support the view that headache arose from an abnormal state of tension in the walls of the cerebral blood-vessels. Biologically, headache signified a perilous position of the brain. Repeatedly paroxysmal headache in a previously healthy person usually indicated a lesion needing surgical intervention.

Prof. G. W. PICKERING (London) stated that only two qualities of pain could be distinguished; the first, a sharp pain, described as pricking if the stimulus was short or burning if prolonged, arose from stimulation of the skin; the second, a dull pain, arose from structures deep to the skin. He agreed with Dr. Northfield that headache in intracranial lesions arose from the disturbance of sensitive structures lying round the blood-vessels when they dilated. A similar mechanism operated in headache produced by injection of histamine and headache associated with pyrexia. He disagreed with Professor Cohen's suggestion that headache was due to cerebral anoxia. One type of headache, common in healthy subjects, arose from prolonged tension of the muscles and tendons overlying the skull, and could be cured by voluntary relaxation.

Dr. T. A. ROSS (London) thought that neurotic patients often spoke of having a headache when they meant that they had painful feelings. Headaches which could not be distinguished in any clinical sense from those of organic origin were sometimes undoubtedly precipitated by psychological factors.

Mr. NORMAN DOTT (Edinburgh) said that he also thought the pain of headache of intracranial origin arose from disturbance of the blood-vessel walls; in general toxæmias also the tone of the intracranial blood-vessels was probably changed. He believed that psychogenic headache was just as true a pain as that with an organic origin. Pain, after all, was only a matter of faith, except when we experienced it ourselves. Dr. RICHARD EAGER (Exeter) pointed out that headache might arise from eye-strain or refractive errors, the correction of which by suitable glasses gave immediate relief. This cause was often overlooked.

Dr. D. R. MACCALMAN (Aberdeen) said that patients complaining of psychogenic headache often described it as unbearable. This quality of unbearableness referred not to the pain but to the psychological cause producing it. Psychological headache was not relieved by analgesic drugs whereas most organic headaches were; similarly, the former did not affect sleep, which was indeed benefited by it, whereas the latter interfered with sleep. In making a differential diagnosis one should also consider whether the headache served a useful purpose—did it relieve the patient of responsibility or unpleasantness? Psychogenic headache was never a single symptom of neurosis and one should never make the diagnosis

in the absence of other positive signs of psychogenic illness.

Prof. HUGH CAIRNS (Oxford) pointed out that a raised intracranial pressure could be altered by, for instance, deep breathing; it was this distention which gave rise to pain. He doubted the validity of Professor Cohen's theory of anoxia, for he thought this a rare state clinically. Functional headache was not a pain in the true sense of the word. A distinctive quality not so far mentioned was its long and continuous duration; a headache which was present for more than three to four weeks was of this type. Occasional migrainous attacks were a common preliminary in aneurysms.

Dr. MACDONALD CRITCHLEY (London) said that typical cases of migraine often began after the age of forty, while some of them were menopausal. Although, as Dr. Curran suggested, headache was frequent in neurotics because the head was the centre of the ego, at the same time such patients often centred their pain in the lumbar region. Many physicians were apt to suggest that functional headache was not real pain but obsessive thinking about pain. He disagreed, for pain could be produced hypnotically which gave rise to the same effects as organic pain. Psychogenic pain was as much pain as toothache.

Prof. COHEN replying said that Professor Pickering, Dr. Northfield and he disagreed mainly on the question of the actual underlying mechanism of headache. There were two alternatives, that the painful stimulus came from the actual blood-vessel wall, and that, as a result of stimulation, the calibre of the vessels changed leading in turn to alterations in blood-supply, the resulting anoxia causing pain. There was no doubt that administration of oxygen cured a migrainous attack. Headache in anæmia was also more easily explained on an anoxic basis.

SECTION OF OTO-RHINO-LARYNGOLOGY

THIS section met on July 26, under the presidency of Mr. H. BELL TAWSE (Nottingham), to discuss

The Bronchoscopist and Bronchopulmonary Disease

Dr. CHEVALIER L. JACKSON (Philadelphia) began by sketching the history of peroral endoscopy. Appreciation of this method of examination had rapidly increased lately; soon every town would have its endoscopists. Careful training of the endoscopist was therefore urgent. In developing the technique of bronchoscopy and skill in recognising endoscopic appearances, detection and removal of foreign bodies was valuable experience. The bronchoscope could be used first to elucidate symptoms of respiratory disease, such as dyspnœa, which were not explained clinically, and secondly to decide about further treatment in already recognised abscesses, unresolved pneumonias and tumours. The oto-rhino-laryngologists had initiated the technique, but Scott-Pinchin, Morlock, and other physicians and thoracic surgeons had contributed to its development. Bronchoscopy was no rival to surgery. Treatment would often be bronchoscopy plus surgery. As for American clinics, in some the physicians, in others the surgeons conducted the operation; in others again there was perfect coöperation between the physician or surgeon and the specialist. More intensive training and knowledge for the bronchoscopist would lead to a new sense of responsibility and justify the use of the new terms broncho-œsophagologist and bronchologist. The specialist was not merely an "-oscopist" but an "-ologist."

In empyema which cannot normally be treated by bronchoscopy it is sometimes found that surgical failure is due to obstruction, removal of which by bronchoscopy is followed by recovery. Bronchoscopy after an operation for empyema may reveal multiple broncholiths which can be removed. Post-operative atelectasis often cleared after bronchoscopic aspiration of viscid secretion. Overholt of Philadelphia was having this procedure carried out as a preventive in some operation cases.

Mr. EWEN MARTIN (Edinburgh) quoted a series of 240 cases of carcinoma of the lung from the Royal Infirmary, Edinburgh, of which not one was operable. Deep X-ray therapy was employed, but 200 died. Greater coöperation between physician and bronchoscopist, he thought, would lead to earlier use of the bronchoscope, earlier treatment and better results. To enable him to carry this greater responsibility the bronchoscopist required better training. This could be achieved only by organising bronchoscopic clinics, but this degree of specialisation would be provided only when the State supplied the means. Special broncho-œsophageal departments should be established in general hospitals. Further opportunity for training would be given if the Home Office endoscopy licence regulations were relaxed to permit the pupil to practise on dogs under the surveillance of the expert. The endoscopist should give the initial and final diagnosis, and his opinion as to when cases should be referred to the thoracic surgeon should be considered.

Mr. V. E. NEGUS (London), in paying tribute to his training in Philadelphia, insisted that his wish had been not to improve but to simplify the Chevalier Jackson technique. In this simplified Chevalier Jackson technique the surgeon worked single-handed. The instruments were kept in formalin and inserted by the surgeon in a quiver by the table. The patient's head was steadied in a rest modified from the Haslinger type. The Jackson type of laryngoscope with twin obliquely set lamps was used. Crouching was avoided by raising the table. The patient was immobilised by means of arm rests. After painting the pharynx down to the pyriform fossa with cocaine, avertin and omnopon-scopolamine were the usual preparations for œsophagoscopy. Local anæsthesia alone was suitable for bronchoscopy in adults. Children required rectal paraldehyde.

Mr. E. J. GILROY GLASS (Nottingham) said that bronchoscopy was limited in pulmonary disease in the upper lobe, where direct vision was impossible. In these cases an adjuvant to bronchoscopy was bronchography, by injection of radio-opaque oil. In addition to its usefulness in defining the extent of disease, this method could demonstrate occlusion of a bronchiole and make earlier diagnosis and operation possible. His experience was that injection under direct vision led to loss of lipiodol by coughing on the way from ward to the X-ray room. After anæsthetising the pharynx and larynx with one per cent. cocaine or a substitute, a 16 French gauge catheter was passed by direct laryngoscopy for 3 inches inside the trachea. The catheter was then anchored by plaster to the cheek and the patient sent to the X-ray room. There, with the guidance of the fluorescent screen, the radio-opaque, malleable and lead-tipped catheter was introduced into the required position. For the lower lobes the erect position, and for the upper lobes the prone position with the opposite shoulder raised, was adopted. By doubling the standard penetration, and in thick chests the standard

time of exposure, lesions invisible to ordinary exposure were revealed.

Mr. H. BELL TAWSE wished to underline three themes from the discussion. There must be collaboration between the laryngologist and physician and surgeon. The voluntary and municipal hospitals must pool their resources and clinical material. In the Nottingham endoscopic clinics more and more cases were being treated. Thirdly, the surgeon doing thoracic work alone could only operate in this country in London and a few of the larger towns. But even in smaller towns he felt that the oto-rhino-laryngologist must prepare for the arrival of the thoracic surgeon. He recommended that a monthly animal endoscopy assistant's licence should be granted which could be used under the direction of the chief.

Mr. C. A. SCOTT RIDOUT (Portsmouth) said that special training should be facilitated by permission to work on dogs. He himself was occasionally called on to remove foreign bodies from a dog's œsophagus.

Mr. P. R. ALLISON (Leeds) said that unless a "tame" endoscopist could be always available, the surgeon must do his own endoscopy. He quoted three cases. (1) A man of 32 with a miner's cough which was found to be due to a bronchial carcinoma. (2) A woman of 54 who was examined 3 weeks after "some toffee went the wrong way"; the left lower lobe bronchus was found to be obstructed by granular tissue above an oat-cell carcinoma for which pneumonectomy was performed. (3) A suspected case of tuberculosis in which the bronchoscope showed only congested thickened mucosa; suction was applied through a curved catheter and malignant epithelium was removed; pneumonectomy was successful. He said that 90 per cent. of bronchial carcinomata were inoperable even if diagnosed relatively early.

Mr. I. SIMSON HALL (Edinburgh) advocated preoperative bronchoscopic aspiration to prevent postoperative chest complications. Mr. T. RITCHIE RODGER (Hull) favoured Mr. Negus's head-rest because it eliminated teamwork, which was impossible in small centres. Dr. DONALD WATSON (Bradford) concurred. Mr. JAMES ADAM (Glasgow) liked preoperative aspiration and also postural drainage in bronchiectasis. Mr. F. T. EDWARDS (Liverpool) said that whether bronchoscopy should be done by the oto-rhino-laryngologist or the thoracic surgeon depended on what the surgeon wanted to know. No picture was so complete as the one seen by oneself. The surgeon would want to see the lesion he was expected to remove. Hæmoptysis in patients over 40 was serious and bronchoscopy must be done early as the margin between the operable and inoperable condition was one of only a few weeks. Dr. H. A. MCCOY (Adelaide) pointed out the difficulty of exactly defining the size of a tumour because the X-ray shadow was partly due to collapse of the surrounding lung. The question of treatment was therefore difficult to decide. Before X-ray therapy was condemned the exact dosage measurement achieved in the Holt Institute in Manchester should be considered. Maximum doses should be used and the size and position of the tumour should be accurately known.

Dr. CHEVALIER JACKSON in reply supported the suggestion of endoscopic clinics in which specialists would treat the larynx as well as the œsophagus and bronchus. The thoracic surgeon and physicians should not be discouraged from doing endoscopy. He commended the use of bronchography and quoted a case of pharyngeal paralysis in which a hazy shadow on a good film near the aorta on the left side was shown up more clearly by lipiodol injection, and later confirmed as a carcinoma. He believed that postural drainage was more effective after bronchoscopic aspiration. He had seen a pulmonary abscess cured by this means, which had also been useful in the treatment and even prevention of asthmatic attacks. He agreed that the surgeon should see the lesion himself, but bronchoscopy only showed the upper edge of the tumour. Exploratory thoracotomy should follow X ray of the chest and search for metastases in the bones, pleura, &c. Deep X rays had been tried by Prendergast and all the Philadelphia radiologists without success in proved cancer cases. So-called successes were cases of adenoma. Tomography was being tried in chest as well as in larynx cases.

Mr. EWART MARTIN said he did not like Mr. Negus's head-rest, but he favoured a clinic, run by a team of physician, surgeon and bronchoscopist working together. He thought the surgeon should see the tumour he was expected to remove but need not become a bronchoscopist to deal with every case of hæmoptysis. Postural drainage was ineffective without bronchoscopy and dilatation.

Mr. NEGUS replied that the failure of postural drainage in bronchiectasis was often due to occluding granulations in the mucosa above the cavity. These could be shrunk at bronchoscopy, and the prolonged drainage effected gave relief for two or three months. If obstruction was due to carcinomatous infiltration with collapse, bronchoscopy would allow expansion and accurate definition of the tumour by X rays.

SECTION OF RADIOLOGY

AT a meeting of this section, with Dr. RUSSELL REYNOLDS (London) in the chair, a paper on

Radiosensitive Tumours

was read by Mr. J. RALSTON PATERSON (Manchester). He suggested that all tumours can be graded into three groups according to their response to radiation, which is as characteristic as the morphology of the group. The first group consists of radio-resistant tumours, arising from the fixed connective-tissue elements of the body and including osteogenic sarcoma, chondrosarcoma, myogenic, neurogenic and fibrosarcoma, liposarcoma and melanoma. The second includes tumours of limited sensitivity which are curable by radiation only if of small size and then only by heavy dosage. Squamous carcinoma, transitional and basal-cell carcinomata, and adenocarcinoma of columnar-cell origin belong to this group. The third group is made up of highly sensitive types and contains, apart from certain well-known and already accepted embryonal tumours of the testis and ovary, a large number of tumours derived from primitive mesenchyme and originating in the hæmopoietic, lymphatic, reticular and endothelial systems, which Mr. Paterson calls the reticulo-endothelial neoplasias. An extended but not exclusive list of these conditions is as follows:—

- Lymphosarcoma.
- Lymphadenoma.
- Leukæmia—
  - Myelogenous.
  - Lymphatic.
  - Erythrocythæmia.
- Ewing's tumour (endothelial myeloma).
- Endothelioma of vascular origin—
  - Hæmangioendothelioma.
  - Angiosarcoma.
- Multiple reticuloses:—
  - (*a*) of lymphoid tissue:
    - Lymphoma.
    - Lymphomatosis.
    - Lymphoblastoma folliculare.
  - (*b*) of storage reticulum:
    - Schuler Christian disease.
    - Gaucher's disease.
    - Niemann-Pick disease.
  - (*c*) of marrow reticulum:
    - Multiple myeloma.
    - Plasmacytoma.
    - Chloroma.
  - (*d*) of mesenchymal areolar connective tissue:
    - Multiple sarcoids (Boeck's).
    - Mycosis fungoides.
    - Kaposi sarcoma.
    - Subcutaneous lymphadenoma.

It is not possible, said Mr. Paterson, to delimit many of these tumours pathologically; the names

are landmarks between which there is no real line of demarcation. As an example, the name lymphosarcoma had been used to indicate tumours of lymphocytes and tumours of reticulum cells, and further confusion has been introduced by the controversy as to which is the primitive stem cell, the lymphocyte or the reticulum cell of the germinal centre. Lymphadenoma shows a wider range of individual sensitivity extending from the highly sensitive malignant Hodgkin's disease to the localised nodes, where the lymphoid structure is almost completely replaced by fibrous tissue and is relatively resistant. According to Ewing, the tumour which bears his name takes on three forms—angio-endothelioma, reticular myeloma and diffuse myeloma. Angio-endothelioma is the best term to cover tumours derived from primitive angioblasts and these have a wide range of malignancy yet are all radiosensitive. Tumours of the pleura, peritoneum and synovial linings are not sensitive and must be regarded as of the same type as the other fixed connective-tissue tumours. Multiple reticulosis is a wide term. The lymphoid types are closely associated on the one hand with lymphatic leukæmia and on the other with lymphosarcoma and lymphadenoma. Of the bone-marrow reticuloses, multiple myeloma is ordinarily regarded as an entity apart from Ewing's tumour.

Sensitive tumours are also found in the nasopharynx and nasal sinuses, the salivary and lacrimal glands, and in the thyroid, thymus and kidney. Mr. Paterson suggested that although these tumours may be embryonal they may well be included under the term reticulo-endothelial neoplasias since they develop in sites of complex embryonic development and some are clearly of recognised reticulo-endothelial origin. When the widespread nature of the reticulo-endothelial neoplasias is realised and their general sensitivity accepted, it is only necessary to relegate an individual tumour to this group to develop a line of approach to treatment irrespective of its exact variety. Where there is doubt as to the nature of the tumour a sensitivity test should be performed, which consists of treating a single nodule or lymphatic node, or of using a field limited to a palpable tumour, and giving a dose large enough to make any sensitive tumour show some response quite rapidly and yet not too large to prejudice subsequent treatment. It is not possible to fix a lethal dose of X radiation for each tumour of this group; while at the upper limit 4000 r in three weeks will cure the great proportion of them, at the lower limit few fail to recur after doses of less than 1000 r administered within a week or two in spite of a spectacular initial response. In general, large fields are necessary, and with such a dose systemic tolerance would not be exceeded.

The generalised reticuloses call for even wider treatment, and the sensitivity may be so great as to bring about disappearance of the tumour completely with doses of 1000 r in three to six weeks. Permanent cure is, however, rare. Mr. Paterson does not regard whole body irradiation as a practical method of treatment, since even with the most sensitive of these tumours the chance of a lethal effect is slight within the limits of tolerance. He concluded that many localised tumours of this class can be cured by full dosage and that their notoriously bad prognosis is often associated with inadequate treatment masked by a spectacular immediate response.

The CHAIRMAN supported Mr. Paterson's suggestion that both pathological and radiological interests would be well served if a registry of the diseases of the reticulo-endothelial system were formed similar to the American registry of bone sarcoma.

Thorotrast in the Diagnosis of Cerebral Lesions

Mr. ROBERT MCWHIRTER (Edinburgh) said that there are cases where after clinical examination, routine radiography and ventriculography, the nature and localisation of the lesion can only be demonstrated by the use of Thorotrast. It may be injected into the blood-vessels (arteriography), into cystic cavities, or into the ventricles. He laid stress on the value of stereography although two injections may then be required because of the rapidity with which the arterial shadow becomes obscured by that of the veins.

In the case of saccular aneurysms of the major basal arteries, while the syndrome is typical, the line of surgical treatment depends on recognition of the exact site. If the aneurysm is below the bifurcation of the internal carotid it can be treated by ligation in the neck but if above direct operative attack is necessary. Both sides of the cerebral circulation may require injection. Arteriography can also differentiate an aneurysm from hæmorrhage in a tumour or from tumours invading the cavernous sinus which may give an identical clinical picture. Arteriovenous aneurysms may cause irritative or paretic symptoms without rise in intracranial pressure. With arteriography they appear as dense irregular shadows and the feeding artery may be so visualised that ligation is possible. Failing this the condition responds well to X radiation. Tumours may distort the normal arterial relations. This sign is of particular value when the first part of the internal carotid within the skull is displaced but superficial tumours, such as post-traumatic subdural hæmatomas, may also be localised in this way. In certain tumours, particularly glioblastoma multiforme, the vascular channels of the tumour may be visualised as large irregular sinusoids, and both its site and nature demonstrated. Mr. McWhirter had found arteriography useful in distinguishing the nature of the vessels in a case of cirsoid aneurysm of the scalp. Where lateral-sinus thrombosis is suspected injection of thorotrast through a burr hole over the longitudinal sinus will indicate that thrombosis has taken place by a failure of the sinus to fill.

Often in preliminary cerebral exploration cystic cavities are found and the injection of a few cubic centimetres of thorotrast into them will enable their nature and extent to be determined. Radiography is performed three or four days later when the thorotrast is flocculated on the cyst walls. The cysts associated with simple tumours have smooth walls and the tumour may be shown projecting into one side, whereas cysts formed within malignant tumours are rough and irregular. Injection of thorotrast into the ventricular system is rarely necessary, but when the third ventricle or aqueduct is narrowed it is difficult to get air into these structures and a fluid medium then gives better results. At the time of operation the thorotrast must be washed out with Ringer's solution as completely as possible.

In conclusion Mr. McWhirter discussed the dangers that may follow thorotrast injections. In arteriography the amount used is small in relation to the lethal dose. In cystic cavities it cannot be of any real danger. When injected into the ventricles it can be washed out again, and in the few cases he has examined in this way there has been no evidence of damage over periods as long as four years after the examination.

Dr. S. COCHRANE SHANKS (London) commented on the high position of the straight sinus as shown in many of Mr. McWhirter's illustrations. He mentioned the danger of ependymitis following the injection of thorotrast into the ventricles and asked whether any other substance is available for this type of work.

Dr. D. S. RUSSELL (London) said that the effect of thorotrast on the vascular system is negligible. It is ultimately stored in the cells of the reticulo-endothelial system. When a tumour is present in the brain, however, her experimental work had shown that small vessels about the tumour are occluded, the symptoms are aggravated and recovery is slow. She did not think intraventricular injection is ever justifiable since even washing cannot prevent some of the substance from remaining in the spaces of the leptomeninges, and the possibility of occlusion and of hydrocephalus later must be considered. In animal experiments this has happened, and she had seen a septic meningitis follow within 24 hours in one case and diffuse ependymitis and fibroid meningitis in another.

Dr. A. E. BARCLAY (Oxford) said that other media have been tried for the purpose of arteriography. Uroselectan intravenously has been found dangerous and abandoned, but Perabrodil in a 35 per cent. solution in quantities of 5 c.cm. gives a good shadow in arteriography; 50 per cent. perabrodil may cause shock.

The CHAIRMAN commented on the value of thorotrast in the outlining of aneurysm, and also in the cysts associated with tumours. He agreed that the intraventricular injection of thorotrast is unjustifiable.

In replying, Mr. MCWHIRTER said that the straight sinus has a rather higher site than that generally indicated anatomically and thought this may be due to displacement when seen in the cadaver. Stereoscopic films can be taken in 0·8 second with suitable teamwork and rehearsals. He did not think that perabrodil would give sufficient contrast for this type of work. Attempts now being made to combine iodine with benzene have not yet reached a practical stage. Intraventricular thorotrast is rarely used and then only as the last means of obtaining necessary information. The fatal dose of thorotrast is ten micrograins; in cerebral arteriography only an eighteenth part of this amount is used.

REVIEWS AND NOTICES OF BOOKS

Menstrual Disorders

Pathology, Diagnosis and Treatment. By C. FREDERIC FLUHMAN, B.A., M.D., C.M., associate professor of obstetrics and gynecology, Stanford University school of medicine, San Francisco, California. London: W. B. Saunders Company. 1939. Pp. 329. 22*s*. 6*d*.

IT is only in the past two or three years that the fruits of the extensive post-war researches into the physiology of reproduction have begun to find their way fully into clinical literature. Professor Fluhman's welcome book is an attempt "to set forth our present concepts of the physiology of the menstrual cycle in women, and the various disorders which may occur under the influence of local and systemic disease." Special emphasis has been laid on endocrinology, but without loss of the general view-point which confronts the practitioner. Dr. Fluhman is in a fortunate position for writing on this subject because, apart from many years of clinical experience, he has himself made several important contributions to the experimental investigation of the human menstrual cycle.

The first half of the book deals with the physiology of the cycle, and the second, which will probably have a far wider appeal, with the pathology and treatment of menstrual disorders. After a historical introduction, there is a discussion of puberty, in which mention is made of the seasonal onset of the menarche and the irregularity and usual sterility of the first menstrual cycles. The growth and the cyclical changes of the uterus, vagina and ovaries are next dealt with, and the length of the menstrual cycle and the systemic changes which occur in relation to it are considered. A brief account of the sex hormones leads on to a chapter on modern methods of investigation; these include techniques for the collection and examination of biopsy specimens of the endometrium, and tests for the various sex hormones in the urine and blood. Dr. Fluhman warns against the too ready interpretation of biopsy specimens because of the different histological pictures which are presented by different endometrial areas. Unfortunately, the first of the two techniques which is advised for the assay of œstrogenic hormone is hardly likely to be found reliable, and will almost certainly prove misleading.

The clinical half of the book opens with a chapter on the practical application of the sex hormones and the use of irradiation of the ovaries and hypophysis in the treatment of menstrual disorders. The various menstrual and menopausal disorders are classified and lucidly discussed. Dr. Fluhman is not carried away by the promise of endocrine therapy, and maintains throughout a conservative attitude to the problems he discusses.

The book is clearly written and well illustrated. In general, too, it is sound, but in the physiological section Dr. Fluhman sometimes subscribes with assurance to views, such as the constant formation of ova during adult life, which are by no means established. Occasional half-statements—for example, that utèrine bleeding can occur during the course of œstrogenic stimulation—leave an incomplete and, in one or two places, misleading impression. On the other hand, the discussion of such clinical questions as metropathia hæmorrhagica leaves little to be desired, and the book therefore deserves wide recognition among clinicians. Experimental investigators of reproduction should also find it a useful storehouse of clinical problems, though it makes no pretence of being a textbook of reproductive physiology.

Textbook of Medical Treatment

By Various Authors. Edited by D. M. DUNLOP, M.D., F.R.C.P.E., professor of therapeutics and clinical medicine, University of Edinburgh; L. S. P. DAVIDSON, M.D., F.R.C.P.E., M.R.C.P., professor of medicine, University of Edinburgh; and J. W. MCNEE, D.Sc., M.D., F.R.C.P., regius professor of the practice of medicine, University of Glasgow. Edinburgh: E. and S. Livingstone. 1939. Pp. 1127. 25*s*.

OF recent years new textbooks of treatment, especially from America, have been numerous. Most of them claim to be modern in their outlook, critical yet constructive; to dispense with the traditional "exhibition" of drugs whose power is a matter of faith more than of reason; to be precise and explicit; to be up to date in respect of new and worth-while methods; to use drugs intelligently, and to concern themselves as much with the management of the patient in the wider sense as with the specific therapy of his disease. But the market is not so full that it cannot welcome another of the kind when it achieves those aims so fully and successfully as does this volume from the Scottish medical schools. In size, form and arrangement it is a companion to the textbook of

medicine edited by J. J. Conybeare and also published by Messrs. Livingstone. Its contributors are two dozen or more teachers from Edinburgh, Glasgow and Aberdeen. It covers the usual range of medicine as taught in this country, together with sections on the commoner skin diseases, some tropical diseases, and some of the commoner diseases of infancy and childhood. There is an excellent chapter by D. R. MacCalman on psychotherapy in general practice, and a useful concluding section on technical procedures and oxygen therapy. Most of its contributors have achieved a freshness of style and approach that makes the book entertaining as well as instructive to read. Their matter is sound and their perspective sensible. We heartily commend what Prof. A. J. Clark describes in his foreword as "a very practical account of the methods of rational therapeutics, of which a large proportion have been evolved during this century."

La chirurgie radicale du cancer de l'œsophage thoracique

By MICHEL BALLIVET, ancien interne des hôpitaux de Lyon. Paris: Librairie Louis Arnette. 1939. Pp. 325. Frs. 50.

IN this thesis the author makes a thorough study of the present position of the surgery of cancer of the thoracic portion of the œsophagus. The anatomical, physiological and surgical questions involved, the various methods of approach and the 24 successful operations which have so far been published are considered in detail. Finally a careful description is given of three cases operated on by the author with his chief, Dr. Ricard, by the method of Torek. All three of these patients died, two within 36 hours and one a week after operation. While this thesis contains nothing that is new, it collects together as the result of much painstaking work all that has been written to date on this difficult and somewhat disheartening subject.

Handbook of Bacteriology

(5th ed.) By JOSEPH W. BIGGER, M.D., Sc.D. Dubl., F.R.C.P.I., M.R.C.P., D.P.H., professor of bacteriology and preventive medicine, University of Dublin. London: Baillière, Tindall and Cox. 1939. Pp. 466. 12*s.* 6*d.*

THIS new edition of a popular handbook has been brought up to date without losing any of its former appeal. The attractive style and the personal touch remain unchanged.

The chief new features are the chapters dealing with streptococci and chemotherapy. The chapter on streptococci has been almost completely rewritten and contains much new matter, carefully chosen and concisely expounded. Happily for the student and others, such terms as *Streptococcus longus* and *brevis*, alpha, beta and gamma hæmolysis are now omitted, while *Streptococcus viridans* and *Streptococcus scarlatinæ* are no longer described as separate entities. The only terms retained are hæmolytic and non-hæmolytic streptococci, the latter including *S. salivarius* which produces a greenish discoloration on blood agar, and *S. fæcalis* which does not. The author adds "this is certainly an unwarranted simplification of the true position, but for practical purposes it will suffice, until more general agreement has been reached as regards these organisms." The Lancefield groups are well described; the actual method of performing the precipitin tests, however, is not mentioned, and one wonders whether a short paragraph on this subject would not have been more useful to students and practitioners of the future than the somewhat detailed accounts, elsewhere in the book, of opsonic methods, phagocytosis and the standardisation of antitoxins.

In the chapter on chemotherapy the use of mandelic acid in urinary infections is now mentioned and a new paragraph on the uses of sulphanilamide drugs is included. These drugs are also mentioned in connexion with the treatment of gonococcal, meningococcal, pneumococcal and streptococcal infections. Other additions are the description of tetrathionate broth and its uses in the isolation of *B. typhosum* from the stools. The significance of the Vi titre in typhoid is stressed, *B. paratyphosum* C has been added to the salmonella group, and staphylococcal enterotoxins are mentioned in connexion with food-poisoning. Some modifications are introduced in the methods of concentration and culture of tubercle bacilli. The tuberculin-patch test has been omitted, although this is now extensively used.

In classification, the author has not invariably followed Bergey's lead in the "Manual of Determinative Bacteriology," sometimes preferring the more conservative nomenclature of Topley and Wilson. Morax-Axenfeld's diplobacillus and Ducrey's bacillus are included in the genus hæmophilus with the bacilli of Koch-Weeks, influenza and whooping-cough. In the chapter on technical methods, students and their teachers would perhaps have welcomed a description of Albert's staining method for *C. diphtheriæ*, and of the modified method of gram staining as used by the American Society of Bacteriologists. No reference is made in the chapter on blood-culture to the use of sodium polyanethol sulphonate or Liquoid. Among the new illustrations are some photographs of viruses by Van Rooyen. The plate representing the comparator box for determining the pH of media is less clear than in the old edition. Apart from the few omissions mentioned, the manual is very comprehensive and answers the definite purpose for which it has been written.

Treatment of Rheumatism in General Practice

(3rd ed.). By W. S. C. COPEMAN, M.D. Camb., F.R.C.P., physician in charge, chronic rheumatic diseases, West London Hospital; physician to the British Red Cross Society Clinic for Rheumatism, Peto Place. London: Edward Arnold and Co. 1939. Pp. 276. 10*s.* 6*d.*

THIS book is deservedly popular. In the new edition chapters have been added on gout and some new methods of treatment. Physical, orthopædic, and occupational therapy are fully and satisfactorily described. Throughout those arts which are based on the author's personal experience bear the stamp of close observation and practical judgment, but occasionally statements are quoted from the work of others which do not appear to have been put to the test or, in some instances at least, they would not have been mentioned. The suggestions for diet in rheumatic diseases are useful but it is not obvious why vegetables and fruits liable to oxaluria should be prohibited in gout; they are indeed often beneficial, and spinach in particular was highly commended by Luff. There are more misprints than one would expect in a third edition, and a curious confusion seems to have arisen between guaiacum and guaiacol. The author says he prescribed guaiacol in the form of the "Chelsea Pensioner"; this however does not contain guaiacol but guaiacum; "tincture of guaiacol" will provide a puzzle for the pharmacist.

The book is written in a pleasant and interesting style and will be of real value to the practitioner.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 23, 1939

THE HOSPITAL SERVICES

"There is always a great waste of personnel in war. You cannot provide for the average incidence of injury and disease. You are either overwhelmed with work or you have nothing to do. It all depends on that unknown factor, the enemy's mind. Personally, I do not think we can make any real complaint about things at present. They're bad, but not too bad. I've seen worse."

THESE words from a correspondent embody the long view. The hospital services of this country, and especially of London, have been adapted overnight to take a new and different kind of strain; the Government's object—to secure 200,000 beds for casualties and some sort of staff and equipment for them—has been achieved; and if air-attack had already begun we should probably be regarding the arrangements as a triumph of organisation. As it is, the state of the enemy's mind has provided a breathing-space in which to be critical and try to correct faults in the machinery. So far as the emergency hospital services are concerned these faults, in ascending order of importance, are: hardship to personnel, inefficiency of working, and neglect of the ordinary needs of the population.

War breeds injustice everywhere, but we trust means can be found to rectify some of the inequalities of sacrifice demanded of the members of the Emergency Medical Service. Almost all consultants in London have been mobilised, or on call, since the war began, and most of them have ceased all other work; but those who are merely "held in readiness" receive no pay, and some of those who (misreading ambiguous instructions) reported for duty at their allotted posts now learn that they will be expected to pay for their billets! The rates of remuneration are, perhaps inevitably, crude; housemen and former registrars have had their incomes suddenly raised beyond their dreams, while experienced men with heavy domestic obligations find themselves with salaries that will mean rapid (though not discreditable) bankruptcy. Often they lose even more than those joining the fighting forces as juniors, for these at least have hope of promotion and of pensions for their widows. Cannot marriage and family allowances and pension rights be provided in the E.M.S., so as to reduce the penalties of dutiful citizenship? Meanwhile, consulting-room rents, insurance premiums, educational fees, and income-tax demands will continue, and many consultants are asking whether they cannot take a day or two's leave each week, when circumstances permit, to keep together the nucleus of their practices. If such permission were general it might be fair enough, but we fear it would be wrong in principle. Full-time status should rule out part-time practice. Nor is the Ministry's offer of leave without pay generally acceptable, for consultants who have wound up their work for the time being will seldom wish to unwind it for what may be only a week or a month. There is more to be said for the latest plan by which some of the senior men who prefer to return to private work will, if they wish, be released from full-time obligations, and will attend the hospitals as part-time consultants until their full services are needed.

The efficiency of the new casualty service depends on its personnel and its equipment; and we are confident that it is capable of rising to any possible occasion. Clearly, however, it would work more smoothly if there were some revision of the appointments made, since many people are being asked to undertake duties unnecessarily remote from those they normally perform, and great skill is sometimes harnessed to primitive tasks. Both as regards equipment and economy of talent much advantage might be secured if the Ministry of Health would send commissioners to survey the whole service—starting perhaps with casualty-clearing stations and working outwards. The commissioners should have power to correct anomalies, supply deficiencies, and give definite rulings; for in an organisation built hastily on a mixed foundation of local patriotism, bureaucracy, and the decisions of harassed sector officers, mortiсed by goodwill, there is necessarily much to amend. Apart from official action of this kind, we believe it might be useful if the doctors in each sector or area formed a committee to canalise and present their many ideas for the betterment of the service.

The neglect of everyday needs of the population has now been recognised as dangerous, and hospitals in London are being encouraged to admit a few patients. What is more important, however, is the reopening of outpatient departments and the return of some of the men who run special clinics —e.g., for diabetics. If London is attacked, outpatients must still be seen there, but whether it is attacked or not most inpatient treatment must now be undertaken in the country. It is here that we come up against the difficulty that London patients cannot be admitted to the hospitals run by the authorities of other counties, and if this difficulty can be overcome in no other way it may be necessary to unify the entire hospital service under the direct control of the Ministry of Health. Already the voluntary hospitals, willy nilly, are existing from week to week on the Ministry's cheques, and if municipal hospitals are to change in function and accept Government-paid staff they cannot preserve a local outlook, and their own institutions and officers may have to join the national service. The past fortnight has seen the consultants of the London area sitting idle while patients in need of help have waited on the other side of inviolable barriers. If circumstances have planted a first-class gynæcologist or orthopædic surgeon at a hospital outside London, it seems folly not to let him, between air-raids, use his talents for the benefit of the people round about. If the organisation for

this purpose does not exist, it must be improvised. On another page Dr. HELEN MACKAY gives an excellent example of the sort of work pædiatricians might do among a population largely evacuated, and there is no lack of desire among any kind of consultants and practitioners to do their best in the station to which they have now unluckily been called. What they insistently demand is to be allowed contact with the patients they can help.

CAUSATION OF CARCINOMA OF THE BREAST

AN important experimental contribution to the ætiology of mammary cancer is made by GREENE in three papers.[1] In 1929 he began to establish a colony of rabbits with the object of studying the incidence of neoplastic diseases among them. One of the animals then purchased was a Belgian hare, which afterwards developed a cystic condition of the breast. As it was not possible to maintain the offspring of this animal by close inter-breeding, other strains of Belgian hares, and subsequently of English rabbits, were used for crossing. The English rabbits were later found to be a second source of breast tumours, which were however of a different type. In the colony of rabbits thus formed a surprisingly large number of mammary tumours developed spontaneously. This is in itself interesting, because mammary tumours have hitherto been but rarely found in rabbits. It is well established that in every species of animal so far investigated the spontaneous development of cancer is focused on only one or two organs, and that these specially susceptible organs vary from species to species. In the rabbit the most favoured site for neoplasia is the uterus.

The mammary tumours developing in GREENE'S colony fell into two groups which could be distinguished clinically and morphologically. Of 25 animals the development of neoplasia was preceded by a cystic disease of the mamma in 21, while in the remaining 4 no antecedent mammary change was observed. Frequent biopsies of this material showed that this cystic condition clearly resembles that found in Schimmelbusch's disease in women. Thence it passes into a stage of non-invasive neoplasia, in which growths are found still within the normal boundaries but already possessing the abnormal cellular morphology associated with frankly malignant tumours. Eventually this stage passes into the stage of invasion that characterises a fully developed mammary cancer. In the 4 animals in which the cancer did not supervene on cystic disease the malignant process was at first confined to a small number of acini, the resulting tumours showing an adenomatous structure. Metastases were found in both groups of tumours, and in some animals were widespread. Of the numerous photomicrographs presented by GREENE many show a striking resemblance to those of human cancer reproduced by CHEATLE and CUTLER in their well-known book on Tumours of the Breast. In view of the constancy with which cystic disease and neoplasia succeeded each other in these rabbits GREENE concludes that they probably represent progressive stages of a pathological process.

He finds further evidence of such a relationship in the fact that the endocrine system of his rabbits showed changes corresponding to those described by CRAMER and HORNING in inbred mice with a high incidence of mammary cancer and in mice in which mammary cancer had been induced by the long-continued application of œstrogens. Thus he observed extensive degenerative changes in and around the medulla of the suprarenal glands. While these adrenal changes were found in association with both types of mammary tumours, changes in the pituitary were seen only in those rabbits in which neoplasia had been preceded by the cystic condition. In these animals the pituitary was greatly enlarged, the enlargement being almost wholly due to hyperplasia of the chromophobe cells of the anterior part, which in a few cases was so localised as to form an adenoma. These findings lend further support to the idea that a characteristic disturbance of the endocrine balance is concerned in the causation of the type of mammary cancer associated with an inherited susceptibility. This should encourage clinical pathologists to examine more closely the endocrine organs in cases of mammary cancer, especially those with a family history of this form of carcinoma.

1. Greene, H. S. N., *J. exp. Med.* 1939, **70**, 147.

TREATING ANXIETY STATES

MORBID anxiety, like cloudy swelling, is present in most people at some time or other. Anxiety is probably the commonest psychological reaction to stress, and is a frequent accompaniment of organic disease, colouring and distorting the clinical picture. It is known that the autonomic disturbance associated with anxiety lowers the threshold of visceral and somatic sensibility, and this has often been used to explain the somatic symptoms of which these patients complain. In a recent paper KERR and co-workers [1] have drawn attention to the need of a fuller understanding of these mechanisms and a broader approach to their treatment. It is recognised that the majority of cases of cardiospasm, pylorospasm and spastic colon have a basis of anxiety, and the authors point out that while drugs of the atropine group are valuable when excessive peristalsis gives discomfort, psychological investigation offers hope of an understanding of the nature of the disease and the possibility of a permanent recovery. It is a pity that most of the cases of anxiety state with somatic symptoms are treated either by suggestion and drugs which can act only by suggestion, or by sedatives such as bromide and phenobarbital, psychotherapeutic investigation being omitted for economic reasons or from lack of time. The results of such palliative treatment are good, because the initial causative environmental stress passes with time, and a certain equilibration of psychic conflicts takes place. But the fundamental maladjustment, the psycho-pathological process, remains unchanged. The authors point out that despite

1. Kerr, W. J., Gliebe, P. A., Soley, M. H., and Shock, N. W., *J. Amer. med. Assoc.* 1939, **113**, 637.

active treatment there will always remain a small group of "psychopathically and protoplasmically" inferior patients who are untreatable. The danger would appear to be the tendency to include in this group many of those hypochondriacs whose symptoms have developed during the course of an untreated anxiety state which has lasted for years and in which the anxiety is now latent. In the clinics and out-patient departments of this country will be found many such patients towards whom the doctor has developed an attitude of complacent nihilism. This group constitutes a large proportion of the chronic neurotic population and is becoming a slur on psychiatry. If it is vital to exclude the organic it is even more important to exclude it rapidly and finally, as the habit of recurrent test-meals, X rays, and blood-counts, without coincident psychological investigation, produces the soil most fertile for hypochondria. Again, hypochondria is encouraged in just those cases that are treated by suggestion and drugs alone, whether or not they recover, because in the latter event the patient's initial resistance to the psychological approach is reinforced by the conclusion that the original cause of his trouble must have been physical, since it was relieved by medicine.

MEDICAL LIBRARIES IN WAR-TIME

FOR one reason or another the first fortnight of the war found three of the principal medical libraries closed, one with half its stock boarded up and inaccessible, one with three-quarters and another with the whole of its staff gone. We trust that this does not represent the general policy to be followed; for as the work of the medical profession becomes greater, not less, in war-time than in peace, its need for information may be more, not less, urgent. In a long war the profession will need the most up-to-date information that can be provided by well-equipped and efficiently managed libraries. The chief requirements, as we see them, are fourfold: an adequate service for the loan of books and periodicals and the supply of information to the medical officer overseas; a similar service for the profession in this country; library facilities for medical students in the centres to which they have been transferred, if such are not already present; and the usual, or rather enhanced, provision of material for the essential research that must be carried on.

To coördinate all the sources of information a central bureau should be set up by some such body as the Ministry of Information or the Medical Research Council. Any doctor, wherever he is, who requires a book or piece of information for essential work, should be able to obtain it without formality and with the least possible delay through the agency of this central information bureau, which in its turn should be able to draw upon the resources of all medical or scientific libraries able to produce the required book or information. The present is no time for parochial considerations, and all medical libraries, whether belonging to government departments, university institutions or private societies, should coöperate to the fullest possible extent, relaxing if necessary some of their usual rules and restrictions. If this entail, as it probably will, extra cost, and to private societies loss of revenue owing to the removal of any special privileges due to membership, this may have to be made good by government subsidy. In time of war facilities should not be withheld merely because those requiring them do not happen to be members of the particular institution able to provide them. This raises another question—that of skilled library staffs. Medical libraries are of little if any use without librarians. During the last war the library of the Royal Society of Medicine had such demands made upon it by the medical officers of our own and allied armies that it was found necessary to obtain exemption from military service for its expert staff. The need this time, as we have indicated above, will be even greater, yet there is no mention of medical librarians in the Ministry of Labour's list of reserved occupations, and we learn that already some members of medical-library staffs have been called up for the Army, while others, less excusably, have been given notice to leave without any alternative work being offered to them.

One final word. Just as the healing art knows no national frontiers but is at the service of friend and foe alike, so medical science is international. Though doctors are temporarily cut off from personal intercourse with their colleagues in enemy countries, they cannot afford to be deprived of the latest medical literature of such countries. We are glad to hear that this question has already been considered by the Booksellers' Association and that a deputation is to be sent to the appropriate government department. It is essential that no prohibitions on trading with the enemy should be allowed to hinder the exchange of medical information across national frontiers.

SAFETY FIRST

IN spite of the instinctive contraction of expenditure in war-time, and the prospect of still heavier taxation, the practitioner is emphatically advised to maintain his membership of a professional defence society. War may bring many medical men into even closer relationship with the public. Previous experience indicates that, while hostilities are in progress, people are slow to embark upon litigation, but, when peace comes, they bethink themselves of all sorts of legal rights, justified or otherwise. It is common knowledge that nearly fifty per cent. of the allegations of negligence and malpraxis occur when the doctor has sent in his account for fees. The recovery of fees will not become more easy now, nor presumably will the allegations become less frequent. It is not merely the worry of these allegations against which the practitioner needs to be protected. When his defence succeeds, he may find himself unable to recover any costs from an impecunious plaintiff. The report of the Medical Defence Union, to be presented to the annual general meeting next week, contains evidence of the manifold risks to which the practitioner is exposed.

ANNOTATIONS

PRESERVATION OF BLOOD FOR TRANSFUSION

MANY people nowadays are wondering how best to preserve blood for transfusion, and there is still no universal agreement as to the best anticoagulant. Until lately sodium citrate was almost the only anticoagulant available. Heparin is now on the market but there is as yet no evidence that it has any advantage over citrate and expense seems likely to limit its use on a large scale. Sodium citrate was in general use before the question of storing blood for transfusion had arisen. On the assumption that a 3·8 per cent. solution is isotonic with human blood it was usually used in this strength. Actually such a solution is isotonic with rabbit's red cells, whereas human red cells are isotonic with a 3·5 per cent. solution. The difference, however, is of little importance. The addition of 10 c.cm. of 3·8 per cent. solution of sodium citrate to 90 c.cm. of blood has been used for a long time to prevent coagulation and is entirely satisfactory. Some workers use higher concentrations; Schörcher [1] recommends 5 c.cm. of a 10 per cent. solution to every 95 c.cm. of blood, giving a final citrate concentration of 0·5 per cent. Others, impressed with the possible depressant effect of an excess of sodium ions in the circulation, have used citrate in amounts to produce a final concentration as low as 0·25 per cent. (Knoll and Märki [2]); this has been equally satisfactory in preventing coagulation.

All simple citrate solutions are used in bulks of from 5 to 10 c.cm. to every 100 c.cm. of blood, thus producing minimal dilution of the blood. Under these conditions, blood keeps satisfactorily for a week or even longer. Thereafter some degree of hæmolysis appears and is invariably present after ten days. Even in the face of slight hæmolysis, the blood may still be used for transfusion with satisfactory results. Many attempts have, however, been made to devise anticoagulant fluids which would delay the onset of hæmolysis. Most of these call for a much greater dilution of the blood than do the simple citrate solutions. One of the first of these fluids was that of Bagdassarov,[3] usually known as I.H.T. This is mixed with blood in equal volume and gives a final citrate concentration of 0·25 per cent.; in addition to the citrate, it contains sodium and potassium chloride and magnesium sulphate. Elliott et al.[4] report favourably on it, but Harrington and Mills [5] could find no value in the extra salts. They recommend a solution of 1·05 per cent. sodium citrate, 0·3 per cent. glucose and 0·15 per cent. sulphanilamide dissolved in normal saline and added to the blood to be preserved in the proportion of 1 to 2; this gives a final dilution of the blood by one-third and a final citrate concentration of 0·35 per cent.

Only experience can show the ideal anticoagulant and preservative fluid for blood storage. At present we may say that blood stored with sodium citrate added so as to produce the minimal dilution and to give a final concentration of 0·3 per cent. citrate or over will form no fibrin; further, provided it has been kept sterile, it will not show hæmolysis for a week or even longer, and will remain suitable for transfusion for at least ten days. It still has to be shown that greater dilutions make longer storage possible. It goes without saying that stored blood should be kept reasonably cool; a temperature of about 4° C. is usually recommended and is quite satisfactory; refrigeration, although desirable, is not essential; granted sterile withdrawal, a satisfactorily prepared anticoagulant and clean bottles, blood will keep in a state suitable for transfusion in any cool room such as a cellar or larder for a week or longer.

1. Schörcher, F., *Münch. med. Wschr.* 1939, **33**, 1268.
2. Knoll, H., and Märki, H., *Schweiz. med. Wschr.* 1939, **33**, 744.
3. Bagdassarov, *Sang*, 1937, **11**, 466.
4. Elliott, G. A., Macfarlane, R. G., and Vaughan, Janet, *Lancet*, 1939, **1**, 384.
5. Harrington, C. R., and Mills, A. A., *Brit. med. J.* 1939, **1**, 1202.

SEEING IN THE DARK

THE blackout has made us more aware of the extent of the sensitivity of the retina when it is dark-adapted and the differences between vision during daylight and vision at night. Hecht [1] defined the dark-adapted eye as one "whose sensitivity to light has reached a constant value as the result of a sustained stay in the dark." Before the eye becomes adapted there is a latent period of a few seconds when everything looks black, followed by a sharp rise in sensitivity for about 30 minutes, then a slowing, until at the end of an hour dark-adaptation is complete.[2] Vision in the dark-adapted eye takes place in the periphery of the retina and is a function of the rods in which the visual purple is contained. The central portion of the retina undergoes little or no adaptation and central vision is therefore not so good as peripheral. This can be shown by looking at a group of stars directly—i.e., with central vision—when perhaps 4 or 5 will be counted. If, however, the group is looked at from one side so that the image falls a little distance from the fovea 6 or 7 will be visible. Anything which interferes with the function of the periphery of the retina or the formation of the visual purple will prevent adaptation. Night-blindness occurs in diseases of the pigment epithelial layer of the retina, such as retinitis pigmentosa. Visual purple is said only to form when the rods are in contact with healthy pigment epithelium; night-blindness, however, does not occur in albinos.[3] During the last war night-blindness was found in conjunction with diet deficiencies and it responded well to cod-liver oil. Vitamin-A deficiency has been found to account for night-blindness in some cases, and it has recently been suggested [4] that those about to undertake night work, such as driving a motor-car, should first fortify themselves with a vitamin-A concentrate in order to ensure the proper functioning of the visual purple.

Peripheral vision is not nearly so acute as the central vision of the daytime, but in the dark-adapted eye movement is more clearly seen peripherally. Therefore, although it may be difficult to define the nature of an object at night if it moves, that movement can be seen—a fact of great importance when dealing with traffic in a blackout. The clearness with which an object is seen depends very much upon its background. Colour is recognised earlier if there is any illumination, however feeble, in its vicinity. Different colours are more easily seen on different backgrounds. Thus red and yellow are seen earlier on white and green on black.[5] On a moonless night shadows are virtually absent, so that stereoscopic vision is less efficient, and distances consequently harder to judge. As the eye becomes dark-adapted the apparent brightness of colours changes. In daylight yellow is the brightest

1. Hecht, J., *J. Gen. Physiol.* 1927, **10**, 783.
2. Adler, F. H., Clinical Physiology of the Eye. New York, 1933, p. 199.
3. Duke-Elder, S. W., Textbook of Ophthalmology, 1932, vol. i, p. 952.
4. Vaillant, C., and Gillis, L., *Lancet*, 1939, **1**, 149.
5. Aubert, Physiologie der Netzhaut, 1865.

colour. At night green becomes more easily recognised than yellow, blue, and red—in that order. This fact becomes apparent on taking a country walk when the green of the grass becomes the most easily seen colour. In the completely dark-adapted eye vision is achromatic and all colours have the same hue, differing only in intensitiy.

IMMEDIATE CLASSIFICATION OF HEAD INJURIES

THE early and wise classification of casualties is one of the most essential parts of war medical service. Ambulances must not be filled with moribund or dead patients, when there are others whom surgery can save. Sinclair-Loutit [1] emphasises the need for the special study of head injury in this light. He points out that a patient who is in coma may merely be suffering from extradural hæmorrhage which can be readily relieved by operation, whereas a restless patient may have the mid-brain sectioned, and be beyond all help. From his experience in Spain he concludes that the following three signs are of very grave import: a continual discharge of cerebral matter; a very feeble pulse (the rate being less important); and what the Spaniards called "carfologia sexual"—a continual fumbling with the genital organs.

Head wounds are never easy to classify, and the difficulties are greater under war conditions at a receiving-post. It will probably be agreed that wherever there is a strong pulse the chances of recovery are fairly good even when the patient is deeply unconscious, provided any necessary surgical treatment can be promptly carried out. On the other hand if a pure brain injury is associated with profound shock and coma, with a feeble and accelerating pulse, the prospects are poor. At the same time it must be borne in mind that the signs of shock may be due not to the brain injury, but to some complication such as hæmorrhage from the scalp, exposure or injuries to other parts of the body. The neurologist can obtain further information in these cases from his investigation of the nervous system, but the casualty officer may be advised to concentrate his attention on the state of the patient's circulation in his attempt to pick out cases suitable for major surgery. He will do well to remember Sinclair-Loutit's observation that many favourable cases are mentally confused or even comatose when the patient is first seen.

A WAR-TIME PHARMACOPŒIA

THE upward movement in the prices of drugs has accelerated; it has also spread over a wide range of articles. In some cases the advance in values has been great, but this does not necessarily imply that there is an acute shortage of such drugs; nor does it indicate that supplies cannot be replenished. One of the reasons for the almost general advance in prices is the desire, expressed suddenly and almost unanimously, on the part of all concerned to enlarge their stocks. There is "a run on the bank," as it were, and the bank has not sufficient bullion actually in its till to meet the run. Nevertheless, the bank is solvent. In the meantime importers of drugs and dealers and all others who constitute the central market for drugs have found it necessary to put a brake on the demands of customers who come to them with unusually large orders; wisely enough, manufacturers and wholesale dealers are rationing buyers, especially those who want to buy too much at once. On another page will be found an indication of recent price changes. In our correspondence columns last week the chief pharmacist of one of the large London hospitals suggested the need to husband the supplies of some of the substances of no great therapeutic value which are now being widely prescribed. He had in mind such things as flavouring syrups, ointment bases and alcohol in tinctures, and he suggested the setting-up of a medico-pharmaceutical committee to compile a formulary for war-time use. It should, however, be borne in mind that we have a British Pharmacopœia Commission whose statutory duty it is to deal with precisely such circumstances as these, and although its ordinary work of routine investigation and laboratory control may lapse for the moment, an emergency organisation has been formed to deal with current matters as they arise. While at present there are in this country ample supplies of drugs and other ingredients of medicines, it may become necessary at any time to make changes in the B.P. formulæ or to introduce new formulæ in order to conserve supplies. Changes of this kind can only be made official by means of an amending supplement or addendum published by the General Medical Council by virtue of its power under the Medical Acts. These possibilities are, we understand, receiving careful attention, and communications for the B.P. Commission may be addressed to the secretary, Dr. C. H. Hampshire, at 44, Hallam Street, London, W.1.

ACCIDENTAL TRANSMISSION OF MALARIA

THERE are now many records of the transmission of malaria by blood-transfusion, in some of which the donor has shown no sign of the disease for years and no doubt seemed a safe source of supply. Lesné, Cayla and Lichtenberger [1] report the case of a child aged 7 months, suffering from severe bronchopneumonia, who received seven daily intramuscular injections of the father's blood, 60 c.cm. in all. The child recovered and all went well for about two months when it developed the typical regular intermittent fever of quartan ague, and had twelve febrile paroxysms in all. No malarial parasites could be found, but the child's spleen was enlarged and the condition seemed so obviously malarial that quinine was given and the fever ceased forthwith. Six weeks afterwards there was a relapse which was again treated successfully with quinine, and two months later, although there had been no further febrile attacks, malarial parasites were found—young intracorpuscular forms, rosettes and a gametocyte of *Plasmodium malariæ*. The source of infection was ostensibly the father, who was born in Cameroon and had lived there until thirteen years before, when he had come to France immediately after having had several attacks of fever, presumably malarial. In France he had shown no signs of malaria, and an examination of his blood, made a week after parasites were found in his child, failed to reveal any parasites. In *The Lancet* of Sept. 2 (p. 556) Dr. Nabarro and Dr. Edward recorded a similar case in which an infant one week old received an intramuscular injection of 7 c.cm. of paternal blood for subarachnoid and gastro-intestinal hæmorrhage, which did not recur after the injection. About five weeks later she developed restlessness, anorexia and sweating, and had several small epistaxes and convulsions. When the child was readmitted to hospital at the age of ten weeks her liver and spleen were found to be large, there was high fever, and blood-examination revealed the presence of typical quartan parasites with a severe anæmia. She went rapidly downhill and died before

1. Sinclair-Loutit, K. W. C., *St. Bart's Hosp. J.* June, 1939, p. 186.

1. *Rev. Palud. Méd. trop.* July 15, 1939, p. 92.

specific therapy could be started. On post-mortem examination malarial parasites and brown granular pigment were detected in the liver and spleen. In this case, as in the former, the father was born in a malarious country—Ceylon—which he left twelve years ago,[2] and although he had been in the habit of taking quinine prophylactically he had never knowingly suffered from malaria and had been quite healthy since leaving Ceylon. Nevertheless, he was definitely harbouring parasites in small numbers, for, although blood-films at first failed to show them, the injection of 10 c.cm. of his blood into a patient with general paralysis produced malaria in that patient, and the father subsequently had a short attack of fever during which a few parasites were detected in thick blood-films. Wright[3] has lately collected records of 29 such cases, in more than half of which the donors had never had recognisable symptoms of malaria. The possibility that donors from tropical and subtropical countries, however healthy, may be a source of malarial infection must be borne in mind when recipients develop fever of the tertian or quartan type, or, with a double tertian infection, even a sharp rise of temperature each day. Where infection is transmitted by blood-transfusion the incubation period will probably be short, and not unduly long as it sometimes is after intramuscular injection.

A GREAT INVENTOR OF LITTLE THINGS

THE recent unveiling of a monument to the chemist Stanislas Limousin in his birthplace, Ardentes-en-Berry near Châteauroux, France, has revived the memory of a fertile inventor. Limousin was born in 1831 and spent much of his comparatively short life (he died in 1887) in Paris where his pharmaceutical activities were prodigious. All pharmacological problems in his day were at once put before him. Consulted as to how obnoxious drugs could be swallowed, he promptly invented the cachet made of unleavened bread or wafer paper in which to wrap them. So simple! So ridiculously reminiscent of Columbus and the egg! When hypodermic medication came into fashion, Dr. Duhomme appealed to Limousin to devise some satisfactory means for providing sterile solutions of uniform strength. He thereupon invented the glass ampoule which is employed to this day as universally as the name of Limousin is forgotten. This invention proved most welcome at the time, for toxic effects from overdoses and polluting infections threatened to bring discredit on the whole system of hypodermic medication. It was Limousin also who devised the 30-litre rubber balloons for holding oxygen, and his expert opinion was sought when the unlucky aerostat, the "Zenith," came into being. When the inhalation of oxygen was in fashion in 1874, Limousin organised an inhalatorium in his pharmacy where all who wished could breathe pure oxygen to their heart's content. The list of drugs which Limousin unearthed from obscurity, and to which most of them seem sadly enough to have returned, includes piscidia and the sulphovinate of quinine, solutions of which he prepared for subcutaneous injection in malaria. It was Limousin who, with his genius for solving big problems with simple devices, hit on a plan for warning the unwary about the poisonous properties of certain drugs. Just give them an alarming colour! In due course official approval was given to this notion, and the sublimate of mercury issued to midwives was coloured with indigo-carmine. The automatic pipette was another of his inventions. Strange that such a benefactor of the human race, so recently dead, should already have become as unknown to most of us as piscidia itself!

2. In the article by Dr. David Nabarro and Dr. D. G. ff. Edward, line 25 in col. 2 of p. 557 should read: ". . . the father was born in Ceylon in 1908 and had lived there until 1926."
3. Wright, F. H., *J. Pædiat.* 1939, **12**, 327.

MORPHINE OR BARBITURATES BEFORE CYCLOPROPANE?

THE increasing use of cyclopropane gives importance to the selection of the most appropriate drug for premedication when one wants to give some adjuvant sedative or hypnotic before the anæsthetic itself. The fact that cyclopropane is in no sense a respiratory stimulant—wherein it differs from some other anæsthetics—would in itself probably make anæsthetists chary of using beforehand any agent that tends to depress the breathing. Chief among these is morphine, and the belief that this should be avoided before administering cyclopropane is strongly supported by some experimental studies in the United States.[1] These show that dogs given morphine before cyclopropane react less favourably to the anæsthetic. Not only is respiratory arrest more readily brought about but also certain irregularities appear before the respiratory arrest—a phenomenon rarely met in dogs having cyclopropane alone. On the other hand, the investigators found that barbiturates given beforehand had a beneficial effect, to the extent that dogs treated with them behaved better not only than those which had morphine but also better than those given cyclopropane only. They believe that whereas cyclopropane intensifies the bradycardia and arrhythmia of dogs given morphine, the barbiturates lessen vagal tone and decrease the irritability of the automatic tissues of the heart; a barbiturate should therefore be given in place of morphine when cyclopropane is used clinically. These experiments will confirm a practice that has already been adopted, on empirical grounds, by a good many of the anæsthetists who have wide experience of cyclopropane.

THE MINER'S IMPROVED LOT

AT the end of 1933 the number of men employed in coal-mines was 772,000, the total mining population being estimated at 3,000,000. Coal-mining is a hazardous industry and beside the risk to life there is hardship and discomfort, while, in the past, the amenities of the mining community have been too little regarded. The recent annual report of the Miners' Welfare Committee[2] indicates a welcome change in attitude. The receipts of the welfare fund amounted in 1938 to £819,458, and since the fund was started in 1920 a sum of £17,500,000 has been expended. A definite proportion of this money must by law be allocated to the provision of pithead baths, and grants for this purpose in 1938 constituted 62·4 per cent. of the total. When present applications have been satisfied, 75 per cent. of the workers will be able to bathe; those who still must do without are for the most part employed in quite small mines. The baths are equipped with first-aid rooms for the treatment of minor injuries, and with canteens. Illustrations in the report show the care which had been bestowed on choice of site and design. The next item of expenditure, 17·2 per cent. of the total in 1938 and 32 per cent. since 1920, has been in respect of recreation: the term covers 1400 schemes of varying type—parks, recreation grounds, children's playgrounds, institutes, libraries. More direct health schemes include the provision and maintenance of

1. Robbins, B. H., Baxter, J. H., jun., and Fitzhugh, O. G., *Ann. Surg.* July, 1938, p. 84.
2. Miners' Welfare 1938. H.M. Stationery Office. 1*s.* 6*d.*

15 convalescent homes, and grants to hospitals, nursing and ambulance services. The last year has shown a new development following the introduction of holidays with pay; the Derbyshire committee has prepared a scheme for a chalet holiday centre at Skegness, with accommodation for 900 persons at a weekly charge of 8s. for adults and half that amount for children. The report indicates how much may be effected in industry by willing coöperation, vision, and humanity.

INOPERABLE CARCINOMA OF THE RECTUM

A PLEA to general practitioners to accept the serious responsibility involved in the management of cases of inoperable carcinoma was recently made by Dr. Thomas Hamilton of New South Wales.[1] It is wrong, as he says, to assume that an incurable growth precludes all chance of restoring the patient temporarily to active enjoyment of life. A great deal can be done by the personal interest of the doctor to allay the anxiety both of the patient and of his relatives. A diagnostic exploratory laparotomy has to be considered in most cases of abdominal growth. Hamilton thinks that it should be undertaken whenever the practitioner cannot be quite sure that operative cure is impossible. He also cites two cases, one of chronic pancreatitis and one of gastric ulcer, in which operation disproved the previous diagnosis of cancer. Occasionally, also, chronic constipation with fæcal impaction may only be diagnosed at laparotomy. In advanced cases operation, even if confined to laparotomy, may be enough to cause the patient's death, and this should be put before the relatives. Mr. Duncan Fitzwilliams, on another page of this issue, advocates laparotomy through a median incision below the umbilicus in advanced cases of rectal carcinoma rather than the performance of a blind colostomy. It is possible to give a much more accurate prognosis if the degree of extension and metastasis is known. Where radical removal is contra-indicated by local extension, the patient's age or the general health, and where there are no metastases, radium therapy and a well-acting colostomy have to be seriously considered. Fitzwilliams believes that the advantages of a colostomy are so great that it should be advised even before obstruction has arisen. The absence of irritation by the passage of fæcal matter over the surface of the tumour lessens the inflammatory reaction and probably the rate of growth, and the general condition of the patient is improved and colicky pains disappear. Fitzwilliams thinks that in the advanced case there is no contra-indication to the use of radium and that nothing but good can come of its use. This is not a universal opinion, for some surgeons are convinced that radium, while it may shrivel up the tumour, does produce a very great increase in the pain. The chances of cure are much less than with such epithelial growths as carcinoma of the cervix, and the screening of the radium must be efficient if untoward local reaction is to be avoided.

R. A. Gardiner,[2] writing from the radium and X-ray department of the Prince Henry Hospital, Sydney, says that though radium has cured cancer of the bowel and in other cases has rendered inoperable growths fit for operation it cannot compete with operative removal. As might be expected, the good results reported by him are in anal epitheliomata. The two main methods he has used in carcinoma higher than the anal canal are the implantation of seeds into the growth and the application of tubes of radium or radon through a proctoscope or sigmoidoscope. Fitzwilliams has found the best method of application is by means of strands of twisted copper wire. He uses 20–30 mg. of well-screened and protected radium mounted on four such strands and guides them through the stricture by the finger or through the sigmoidoscope. The radium is left in position for twelve hours, and is then removed and inserted for twelve hours into the lower colostomy opening. If it has the effect of retarding the local spread of the growth and stopping the discharge of blood and mucus even for a time, there is a chance of improving the patient's general condition and mental outlook. The treatment of the anæmia which is so common is well worth undertaking, and intelligent care of the colostomy and instructions about suitable diet will make the patient less of an invalid. When to tell the patient the truth has to be decided in many cases. Hamilton thinks it is best to tell him the facts calmly and frankly at the stage when he has become impatient at his delayed recovery and at his increasing weakness. If he has had an exploratory operation he may have all along been uneasy in his mind that his recovery from the operation has not, as Hamilton puts it, been greeted with more enthusiasm by his relatives.

1. Hamilton, T., *Med. J. Aust.* 1939, **1**, 817.
2. Gardiner, R. A., *Ibid*, p. 829.

A TROPICAL RETROSPECT

OF all the themes for the medical historian, none is more fascinating than tropical medicine. The struggle against disease in the tropics has had for its setting India, Australia, and colonies and protectorates of the great powers, not to mention the Suez and Panama Canal zones. In two large volumes Dr. H. H. Scott [1] has traced the evolution of this branch of medicine with clarity, good judgment and humour. How far we have moved is shown by the description of conditions in the early days of the East India Company (for India, Scott acknowledges his debt to D. G. Crawford's "History of the Indian Medical Service"). At that time a surgeon-general, on a salary of £20 to £30 a year, had not only to treat the sick but to cut every forty days and in a seemly manner the hair of the company's humblest employees. The story of yellow fever is intimately connected with the Panama Canal and Gorgas, "that modest little man with silver hair" as C. E. Flynn described him. He was ridiculed for his insistence on sanitation by the governor of the Canal Zone, and by the Canal Commission who elected to live safely in New York, and his displacement was determined on by the governor in favour of an old friend, an osteopath. A personal visit to the zone by the president, Theodore Roosevelt, made Gorgas secure by appointing him a member of the commission. Even then the chief engineer remarked "Do you know, Gorgas, that every mosquito you kill costs the United States Government ten dollars"; to this the reply was "But just think, Colonel, one of those ten dollar mosquitoes might bite you, and what a loss that would be to the country." Scott gives a delightful pen picture of Manson, working almost to the last, "hobbling with the aid of a stick, or being wheeled from bed to bed in the hospital, benignant, kindly and sympathetic, patient with everything but slackness and insincerity, courteous to all." One calls to mind the unrehearsed tribute to Ross, when he was wheeled into a meeting of the Royal Society of Tropical Medicine and Hygiene to receive the Manson medal, and the fellows stood as his chair passed forwards. Scott's book is a fitting tribute to these great pioneers of health in the tropics.

1. A History of Tropical Medicine. London: Edward Arnold and Co. 50s.

SPECIAL ARTICLES

SIMULATED MENTAL DISORDERS AMONG SOLDIERS IN THE LATE WAR *

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THE diagnosis of malingering is often very difficult and any attempt to estimate the extent to which it took place among soldiers in the late war would be an almost impossible task. Conditions of life on the front were such that they provided the strongest motives for getting out of the fighting line, yet those with experience will, I believe, agree that few men attempted to do so by means of simulated illness. It was interesting to see how naturally the process of adaptation took place to the fear- and horror-producing situations which constitute the psychological essence of war in the trenches. This adaptation remained even in the last years of the war when the intensity of shell-fire became very great. Sometimes the adaptation mechanism did give way, either as the result of too long continued strain or a sudden shock such as being blown-up or buried. Some were unfitted by temperament for the life from the start and were never able to adapt successfully. But it was an impressive fact that the ordinary man, coming from a peaceful occupation amid peaceful surroundings, rapidly and spontaneously accustomed himself to such an abnormal existence and settled down cheerfully to it.

The constant strain of this strange life became clearer to the individual in perspective when, on account of sickness or wounds, he was sent away from his unit and his friends out of the fighting area. He would have been more than human if he had not appreciated the relief, especially if the sickness or injury did not happen to be serious. Among the war-neuroses seen at an advanced centre in France, malingering showed itself mainly as a tendency to perpetuate the existence of symptoms which would otherwise have passed away in due course, and to exaggerate the severity of those which were present (Dillon, 1939). Other cases, however, also appeared from time to time in which purely or largely artificial states were developed often of considerable complexity. It is with these that this article is concerned. The cases described include only those in whom evidence of malingering was considered to be conclusive.

Simulated symptoms are generally considered to express a conscious and deliberate intention on the part of the individual, whereas those of the neuroses are looked upon as results of unconscious motivation. The distinction between the two, however, is by no means sharply delineated. Conscious and unconscious motives may be combined and it is quite common for a malingerer, if he has undertaken to imitate an easily sustained disability, to become in the end persuaded of its reality—in much the same way as the man who recounts often enough an exaggerated story of his prowess comes in the end to believe it.

CASE 1

A private in an infantry regiment, aged 28, was admitted to hospital in March, 1917, with a note from the regimental medical officer saying that he considered the man was unfit for duty in the trenches and should not have been sent back after a previous attack of shell-shock. When seen shortly after admission, the patient was in an intensely restless, excited state. He appeared to be constantly overcome by terror, acting as though he heard shells coming towards him. Every sound seemed to send him into an extreme state of apprehension. He was apparently unaware of the nature of his environment, and took no notice of questions addressed to him. He frequently went through an elaborate pantomime in which he would stare in terrified fashion in front of him, suddenly point ahead, utter some disconnected remarks such as "Germans!" or "over the top!" then cover his face with his hands and fall back on the bed, or suddenly dive under the bed-clothes. The condition appeared to be a confusional psychosis with vivid auditory and visual hallucinations. He was given gr. $\frac{1}{75}$ of hyoscine and quietened down at once.

The theatricality of the performance was impressive from the outset. For three days the condition was kept up, and it was noted that the crises occurred particularly when he was under observation. When he considered himself unobserved the confusion and terror seemed to disappear, but recurred at once if he was approached. Suspicions had by this time been aroused as to the genuineness of the condition. He was taken into the medical officer's room and, under careful questioning, information was obtained from him which could not possibly have been given if he had been in the condition of confusion his pantomime indicated. Confronted with the situation, he broke down and confessed that on being sent back to the trenches after treatment for a previous attack of shell-shock in another hospital, he could not stand the sound of the guns, but relapsed on the first day, began to shake all over and was again sent down sick. He had two-and-a-half years' service in the army and had been in France for six months. He described how about six weeks previously, while with his battalion, he had been sent out on patrol with a party in no-man's land. The enemy's artillery opened fire and the party were forced to lie on the ground with the shells bursting round them for about twenty minutes. The patient stated that he did not remember any more until he woke up in a shell-shock hospital, very nervous and jumpy. After about five weeks' treatment he was sent back to duty, but on the first day with his regiment broke down, as described above, and decided to simulate a condition which he hoped would bring about his transfer to England. The patient stated that he had been recommended for a decoration for bravery in the field, and had in his possession a white divisional card for good conduct. He expressed his regret and put forward a request to be sent back to his battalion in the effort to make good.

CASE 2

A private soldier, aged 20, was admitted into hospital in July, 1917, and remained for about three weeks in a state of apparent delirium. He sat up in bed most of the day staring fixedly in front of him, to all appearance oblivious of his surroundings and failing to understand what was said to him. He muttered continuously and unintelligibly, the only word which could be distinguished being "mother." There was no sign of disorder of any of the systems and physically he was robust. He could do practically nothing for himself, had to be led about, required to be spoon-fed and obtained a good deal of attention from the ward sister. It was noticed that when approached by the medical officer the rate of his pulse went up, his breathing increased considerably, he perspired freely and swallowed frequently.

These signs, combined with the unusual nature of the condition, aroused certain misgivings. One day, as he was sitting in a chair and being fed by the ward

* Based on a thesis presented for the M.D. at Edinburgh University.

orderly, I stood in front of him and carefully watched the proceedings. After some time his breathing became more rapid, his pulse-rate increased, he began to show signs of agitation, and his face flushed. It was a reaction difficult if not impossible to reconcile with a genuine condition. He was taken into the medical officer's room, soon broke down under examination, and confessed that he had become increasingly nervous in the line and had assumed a fictitious condition as a means of getting out of it. He was overcome with shame at the failure of his deception. He covered his face with his hands and said: "What will the Sister think of me!" This difficulty was smoothed over for him, but it created a sensation in the ward when he walked out of the room a normal man again, and aroused no little bewilderment in the orderly who had been feeding him but a short while before.

CASE 3

Among malingerers loss of memory was fairly common, especially in the later stages of the war. With Alan Breck Stewart in "Kidnapped" these cases might claim to have "a grand memory for forgetting."

Sergeant C. was admitted into hospital in May, 1918, complaining of headache and loss of memory. He stated that he woke up in a field the day before and found that his memory was gone; the last recollection he had was of being on the docks at Karachi in August, 1914, waiting to embark for France. A definite localised amnesia seemed to be present extending over a period of nearly four years. He remembered all his early life before August, 1914, and was able to give a detailed account of it. From notes sent down with the patient there was no evidence of any initial period of confusion such as occurs as a rule in cases of extensive amnesia. In conversation he was alert and bright, accurately orientated and normally quick in reaction-time. His mental state was investigated by the free-association method (Jung 1917). In this a series of test words is given and the reactions noted. A number of significant words were included, designed to reveal the concealed complex which would be present if the patient were malingering. Such critical words as "trick" and "deceive" might be expected, in these circumstances, to produce a special reaction; for example, lengthening of the reaction-time and perhaps an unusual form of association. The results of the experiment are shown in the table.

FREE-ASSOCIATION TEST ON SERGEANT C

Stimulus word	Reaction	Time in seconds	Stimulus word	Reaction	Time in seconds
green	grass	1·5	explode	ball	4·5
hammer	nails	1·5	continue	game	4
whistle	train	1·5	danger	train	4·5
nut	Spain	7	tree	branches	3
smoke	fire	2·5	go	away	5
fill	box	2	beef	steak	1·5
terrible	terrible to lose memory	12	sentence	5 years	3
			river	flowing	1·5
			bat	ball	1
trick	cards	10	dislike	hate	3
burst	bottle	3·5	watch	time	1·5
pay	pay	10	penalty	imprisonment	2·75
for	ever	12			
force	driving	2	point	upwards	2·5
pink	handkerchief	1·5	burn	finger	2
			eat	dinner	1·5
will	dead man	5	key	door	1·5
deceive	wrong	13			

In the absence of proper apparatus, times were recorded with an ordinary watch. I estimated the probable upper limit of normal reaction-time under the circumstances to be 3 seconds, and regarded as significantly lengthened all longer than this. I had used the method previously in similar experiments on patients with genuine amnesia and had found it to be helpful. In Sergeant C. the number of *complex-indicators* was so abnormally great and the reaction-times were increased in such a large proportion of the associations that powerful psychological forces, either conscious or unconscious, were obviously present. In a control experiment with the same list of words on a patient with a slight injury, only one complex-indicator was found—namely, the word "sentence." Even if we assume that this man had an exceptionally rapid reaction-time and regard a wait of 3 seconds as abnormal only four complex-indicators occurred in the list of thirty-one words.

Mere increase in the number of complex-indicators is not, however, proof of simulation. Most cases of the war neuroses show the same phenomenon. But on further investigation by the free-association method, additional evidence was brought to light. For example, when the patient was asked to associate to them, none of the critical words were found to lead to any complex. To each of them a number of apparently indifferent and innocent associations was produced. Very striking also was the prolonged delay which occurred with practically every association that he made. There was no obvious reason why a person quick in mental reactions at other times should show this abnormal retardation under test conditions. The obvious inference was that he was concealing his thoughts, and was not responding with the first word that came into his mind as he pretended to be doing.

The evidence of the association-test was significant but not conclusive. In the light of later developments it appeared to have had an additional value, for it gave the patient the impression that his deception had been penetrated. Perhaps as a result, he almost at once started to exaggerate his alleged mental impairment and coloured the condition rather highly. To impress on the medical officer the simplicity of his mind about the newer inventions of the war, he volunteered the information that another patient had been talking to him about tanks. He had never heard of them before and wondered what sort of things they were. He had seen many of them go past the hospitals on trains; he realised that they were like the old "caterpillars," but could not see how a tank moved along. In view of his capacity to apprehend other things equally difficult, this apparent impairment of understanding was obviously assumed. Other weapons of war such as gas, aeroplanes and the submarine, he "didn't seem to understand it." He had been reading, he said, in the newspaper of the sinking of a liner. He had never before heard of torpedoes, and he could not understand how anything from under the water could sink a ship that size.

Probably a conviction was forming in his mind that the evidence of his trick was increasing and that his embellishments had not produced the desired effect. At all events, a few days later he reported that practically all his memories had returned, in the following circumstances. The day previously, while at dinner, he said, a wasp was flying about and he got up from his seat to kill it. Someone remarked that a wasp's sting was worse when it was dead than when alive, and another sergeant who was present observed that he once saw a man stung on the thigh. He had no sooner said this than the recollection came back to the patient of being wounded on the thigh by a piece of shrapnel in May, 1917; it felt just like a sting at the time. He then got up, he said, went into another room and lay down on his bed, and his memories came back one by one. All the circumstances leading up to his present condition returned to him. He remembered being at his battery and starting out to reach a certain village. A salvo of shells came over, he jumped into a trench, something hit him on the left side of the head and he lost consciousness. He came to himself about two hours later lying on his stomach in a field, feeling dazed, and covered with dust. He thought he was at the docks at Karachi and expected to see the troops about him waiting to embark. He got up and walked about half a mile, then he came

over faint and sat down. When he woke up again—he thought about an hour afterwards—he could not remember anything; his mind was a complete blank. He started to walk along a road when a soldier met him and the patient inquired where he was. The soldier asked what had happened to him and he replied that he did not know. The soldier then took him to a dressing station at F——, and when he sat down he began to vomit. He was asked what his name was but did not know, so they went through his pockets and took out an envelope. When the patient saw the envelope he remembered his name and address, and, in fact, all his memories then came back except the period between waiting for the boat at Karachi and his "coming to" in the field. He could not remember anything of his life between those dates, and he had remained in that condition until the day before, when the episode of the wasp took place. Now, he said, all his memories had returned, except, curiously enough, the fact that he could not remember the identity of a girl who had written to him some weeks before. He could not remember receiving the letter, he said, nor the person who wrote it.

It was a circumstantial, realistic and plausible tale, and at the end of it he said he wished to express his thanks for the treatment. The story proved, however, to be almost completely fictitious. The following morning he confessed that the loss of memory had not been genuine. He had for some time been feeling increasingly nervous in the line and, in addition, relations had become greatly strained between him and the officer of his unit. On the day when he started for the village, shells came over and he got frightened and ran. He was not hit in the head, did not lose consciousness or lose his memory and the incident of the envelope which he had described was an invention. He met a soldier who took him to a dressing station, where he was so frightened that at first he could not give his name. He calmed down shortly afterwards, and as he found he was being sent to hospital he decided to keep up the deception.

CASE 4

Another case of apparent amnesia was that of a soldier who was sent into hospital in July, 1917, as the unidentified man. He had a gun-shot wound of the right hand, the middle finger of which had been amputated. He had been found, about six weeks before, wandering in a village not far from the trenches with the wound in his hand, and was taken to an advanced dressing station. There it was discovered that he had complete loss of memory for the whole of his past life. No information could be obtained from him regarding his name, regiment, home, or any of the details of his life. He did not know, for example, if he were a married man, if his parents were alive, or what was his former occupation. He had no identity-disc, pay-book or other means of identification on his person, and the following day he was sent to a casualty clearing station as an unidentified man. In the latter hospital after representatives from the surrounding regiments had failed to identify him, an attempt was made to obtain some information from him as he was going under and coming out of an anæsthetic, but without result. He remained there five or six weeks obtaining treatment for the wound and making himself useful in the ward.

When examined, he was found to be a bright, cheerful individual, clear in mind, able to understand perfectly what was said to him, and normally quick in reaction-time. He stated that he remembered everything since coming to at the advanced dressing station, but nothing of his life before that time. He could not read nor write, and was unable to name a letter of the alphabet written on paper before him. He declared that he could distinguish between what was writing and what was not writing. He had been in this condition since the time he found himself in the advanced dressing station about six weeks previously. There had apparently been no confusion at the dressing station and certainly not at the casualty clearing station the following day. There was no childishness of manner as was seen in many genuine cases of complete amnesia. His attitude was that of a normal grown man. He was sensible and rational in his conversation and he had no difficulty in apprehending what was said to him. There was no loss of the power to name objects, although, as already noted, he was unable to name the letters of the alphabet. He was capable of counting up to twenty-one, because he had helped the sister in the casualty clearing station who had twenty-one beds in her ward. Beyond twenty-one, however, he was unable to go. He showed no anxiety about his condition, accepted his severe disability with apparent indifference, and displayed no keenness or enthusiasm in filling-in the gaps of memory.

The condition was investigated along the lines described in the last case and within a few days his façade gave way and he confessed the imposture. He stated that he left his regiment when in billets and went up towards the trenches. He had had bad news about his wife and was feeling very worried and depressed. He intended, he said, to do away with himself and meant the shot which injured his hand for his head. When he fired and saw what he had done he "sort of came to himself" and realising the seriousness of his position threw away his pay-book and other means of identification. On being taken to the dressing station and asked his name he said that he did not know. As he found the deception was successful, he maintained it.

CASE 5

The varied symptomatology of the war neuroses made one speculate as to a possible relation between the strain of life in the trenches and the occurrence of a paranoid state with delusions of persecution. Theoretically it was not difficult to imagine a causal connexion and it was, therefore, a matter of considerable interest when the following case was sent into hospital in the beginning of September, 1918.

The patient, a private aged 22, was apparently very apprehensive. When brought into the medical officer's room he held up his finger, glanced over his shoulder and said "Hush!" He then leant forward and, in a whisper, said: "He keeps following me . . . Jerry; . . . all over the show . . . with rosary beads round his neck . . . a big man . . . with black hair and beard and a yellow face." The patient would not speak above a whisper, because, he said, "he'll hear me." In fragments the history was obtained from him. He had gone "over the top" some days before with his battalion and taken the objective. He saw a great many dead Germans including the one who was following him about, who, he said, was strangled by rosary beads round his neck. The following morning they were relieved and went back to the reserve trenches. Two days later, when on their way up to the front line again, the patient said he felt that the German was following him. He turned round, saw the man behind him, and fell down in a state of terror. The German, he said, wanted to get his revenge as he (the patient) had killed a lot of his compatriots with bombs, "hundreds of times on raids." The history was extracted from him with some difficulty, and was accompanied by much screwing up of his face and pointing with his finger in the effort to remember. He frequently interrupted his story with such remarks as "I must go back," and "May I go back?" which seemed inconsistent with a genuine condition of extreme apprehension. On being examined, he would not close his eyes for the rhomberg test, as, he said, "he'll get me." The exaggerated and inconsistent features of the condition led to doubts of its authenticity and a pointed hint was given to him. The same evening he stated that he was much improved. The following morning he reported that the German had disappeared and thereafter left him in peace.

CASE 6

The detection of malingering was sometimes made easy by patients, who aspired too high in their flights of fancy. It is probable, however, that other cases occurred which were never exposed, and from time to time dubious conditions were seen in which an assured diagnosis could not be made.

A case in point was that of a man admitted to hospital in a condition generally resembling a psychosis. His conduct was childish and silly. He gave no real trouble, was clean in habits and enjoyed his food, but was untidy in his person and perverse in trivial matters. Certain features suggested that auditory hallucinations were present and that dementia præcox was the probable diagnosis. There were, however, other features with which this diagnosis could not be reconciled. The following fragment of dialogue is the record of an actual conversation which took place with the patient, and is typical of the only kind of conversation that could be elicited from him :

Medical Officer : How are you getting on now ? Take the match out of your mouth. How are you getting on ?—Patient : Champion, sir.

M.O. : Better than you were yesterday ?—P. : Champion, sir.

M.O. : Why do you keep your eyes closed ?—P. : What you were saying, sir.

M.O. : What did I say ?—P. : The same thing, sir.

M.O. : What do you mean by that ?—P. : Got it, sir.

M.O. : What have you got ?—P. : That.

M.O. : What's " that " ?—P. : Ingersoll watch.

M.O. : Why do you make gestures like that ?—P. : Because they are better ones than those ones.

M.O. : What are " those ones " ?—P. : These ones.

M.O. : What ?—P. : Those ones.

M.O. : What do you mean by that ?—(No answer).

M.O. : What do those gestures mean ?—P. : Life, sir.

M.O. : What's that ?—P. : Polar bear, sir.

M.O. : Why are you stretching out your hands ?—P. : My power, sir.

M.O. : What power ?—P. : What you said, sir.

M.O. : Why do you make those faces ?—P. : Très bon, sir. They are champion, sir. Très bon. Looks champion, sir.

M.O. : What looks champion ?—P. : Ah ! Très bon, . . . New ones.

M.O. : New what ?—P. : Boots, sir. What time is it now, sir ?

M.O. : What time do you think it is ?—P. : I think it's about one o'clock, sir. Do you mean that, Yes ? Take it then.

Even after the case had been under observation for several weeks, no definite decision as to the nature of the condition could be arrived at and he was evacuated to the Base.

The main difficulty at our advanced centre was the lack of psychiatrically trained medical staff. A further drawback was that in the different phases of the war the numbers of patients varied considerably ; during a push we were often swamped with new cases. At these rush times, it is probable that a number of malingerers escaped our vigilance and were evacuated to the Base along with the severe cases. It is essential that medical officers at advanced centres should bear the question of malingering constantly in mind. At the same time, even in spite of psychiatric experience, the diagnosis may be extremely difficult, as has been shown above. If injustices are to be avoided, and unnecessary compensation and pensions saved, it is essential not only that diagnostic psychiatrists should be available, but also that facilities for observation, as long as may be necessary, should be at hand.

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PROFESSIONAL EXAMINATIONS

THIS AUTUMN

ENGLISH CONJOINT BOARD

In consequence of the outbreak of war the committee of management of the Examining Board in England has authorised the following arrangements and modifications in the regulations for the L.R.C.P., M.R.C.S. Section 1 of the final (pathology and bacteriology) will be discontinued. Candidates who have already passed section 2 (medicine, surgery and midwifery) should inform the secretary of the board of the date on which they passed in the last subject. Arrangements will then be made for their names to be submitted to the Royal Colleges, so that they may be granted the diplomas of L.R.C.P., M.R.C.S. Candidates for the final qualifying examination will be allowed to complete the examination on producing evidence of having done thirty months' clinical work after passing in anatomy and physiology, provided that all the specified appointments have been held. Candidates who have done twenty-four months' clinical work after passing in anatomy and physiology will be eligible for admission to one or two subjects of the examination. The regulation requiring the whole of the final examination to be completed within a period of twenty-five months is suspended.

It is anticipated that the first examination (anatomy, physiology, materia medica and pharmacology) will begin on or about Wednesday, Oct. 18. Candidates will be eligible for admission to part I (anatomy and physiology) on producing evidence of forty-six weeks' study in anatomy—including dissection of the entire cadaver—and physiology, all of which may be completed within a period of twelve consecutive months. Owing to the postponement of the examination, entries will be accepted up to the first post on Wednesday, Sept. 27.

It is expected that the premedical examination (chemistry, physics and biology) will begin on or about Monday, Oct. 23. Further particulars of the first and premedical examinations will be sent to candidates as soon as they are available.

The examinations for the Diplomas in Child Health and Public Health due to begin in September and October respectively are postponed for the present. Further information will be published as soon as it is available.

Candidates for all examinations must be prepared to be examined outside London if necessary.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The final examination for the Fellowship will, it is expected, begin on Nov. 9 and the primary examination on Dec. 4 as advertised.

The final examination for the L.D.S. will, it is expected, begin on Oct. 27 as advertised. The first examination for the licence, advertised to begin on Sept. 20, is postponed for the present.

Candidates who enter for the examinations by the appointed dates will be sent further particulars when arrangements have been completed.

SOCIETY OF APOTHECARIES OF LONDON

The examinations conducted by the society will, as far as possible, be continued under existing regulations, but the following modifications are announced.

The premedical examination in science will be discontinued for the present. Examinations of other boards which admit successful candidates to registration as medical students will be accepted as usual.

For the primary examination evidence of a period of forty-six weeks' study in anatomy and physiology, which may run concurrently, will be accepted in lieu of the five terms laid down in the regulations.

Students will be allowed to complete the final examination on showing evidence that they have held all specified appointments and completed a minimum of thirty months' clinical work after passing anatomy

and physiology, and will be admitted to one or two subjects of the examination on the completion of twenty-four months of such study. The regulations which demand the completion of the final examination within a period of twenty-five months will be held in abeyance. The hours at which examinations are held will be regulated as far as possible to ensure completion during daylight: candidates should note carefully the times of attendance indicated on their cards of admission.

PUBLIC HEALTH

Health-Instruction Officers

BEFORE the outbreak of war the Nottingham county council were considering the appointment of a health officer to coördinate instruction of the community. Such officers are not uncommon in the United States, but so far we have had none in this country, though we have many unofficial health instructors, from newspaper correspondents to public lecturers, and health teaching is one of the cardinal duties of every health officer.

The chief work of a health-instruction officer is to retail physiological sciences to the community in a form which the public can digest; but in addition he should be able to translate research into terms of action for the benefit of health officers. The Medical Research Council, the Industrial Health Research Board and all other bodies and persons engaged in furthering the science of medicine complain bitterly and frequently that the goods they deliver are not utilised and that discoveries with wide possibilities of practical expression lie on the table for months or years—often until they are forgotten. Nobody can be blamed for this, for the language of research is not that of medical practice; the language of medicine is not that of the people, and there is no interpreter.

Notts county were prepared to consider appointing a health-instruction officer if a suitable candidate could be obtained, but doubt was expressed whether any was forthcoming. In our issue of July 22 we published an address by Dr. Iago Galdston of the New York Academy of Medicine, entitled The Health Educator, which gives a clear view of what such a person should be and how he should act. From this it is obvious that efficient public health instructors will not be obtainable easily, for those possessing all the necessary attributes can command high places in numerous branches of industry; but in a peaceful world, in which the object of governance is the prosperity and happiness of the peoples, the position of health instructor would be highly attractive to persons of superior wisdom.

Medicine for Evacuated Children

Correspondence has passed between the Ministry of Health and the organisations representing pharmacists concerning the supply of medicines for unaccompanied children who have been evacuated under the permanent scheme. It would seem that in making provisional arrangements with the Central Emergency Committee for medical attendance on such children, including the supply of medicines, the Pharmaceutical Emergency Committee was not consulted. The Minister of Health has now explained that it is not proposed that payments to doctors should be made at a capitation rate; in fact it seems doubtful whether such a basis could be adopted in view of the uncertainty of the duration of the stay of each child. The Ministry's proposal is that the amount to be allocated by the Government for each reception area, although calculated in the first instance at a flat rate of 10 shillings a head, should be handed over to the local medical emergency committee, who will evolve their own scheme for remunerating the doctors either on the basis of payment per visit or such other basis as they may consider appropriate. The Ministry, in a communication to the secretary of the National Pharmaceutical Union, says "the doctors will doubtless follow their normal practice in the matter of supplying medicines or giving prescriptions, and in either case the cost will be met out of the local pool." The Ministry understands that in some areas doctors who are not accustomed to dispensing have expressed a wish to be allowed to give prescriptions which could be dispensed by any chemist. Although the children are not insured persons the Ministry is prepared to agree that the pricing bureau under the National Health Insurance scheme may be used for the purpose of allocating payments to the chemists in respect of medicines so supplied. It would be well if the local medical and pharmaceutical committees were able to agree on terms which will make for the smooth working of this emergency scheme.

The Weekly Return

In his weekly return (1939, no. 36) the Registrar-General points out that the return of deaths relates to civilians only—i.e., it excludes the deaths of serving sailors, soldiers and airmen. The births and deaths assigned to towns or other areal divisions of England and Wales are those actually occurring in the respective areas without regard to or adjustment for usual residence. Furthermore, owing to the partial evacuation of populations from London and some of the large towns, the weekly birth- and death-rates cannot be calculated with accuracy and are discontinued for the present. The estimated populations at the middle of 1938 (given in table 1) no longer correspond even approximately with the deaths in that table for many towns, but being the latest available estimates of the populations normally resident therein they are still included.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 9, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1106; diphtheria, 782; enteric fever, 77; pneumonia (primary or influenzal), 237; puerperal pyrexia, 166; cerebrospinal fever, 16; poliomyelitis, 30; polio-encephalitis, 1; encephalitis lethargica, 1; dysentery, 19; ophthalmia neonatorum, 78. No case of cholera, plague or typhus fever was notified during the week.

Deaths.—In 126 great towns, including London, there was no death from smallpox or scarlet fever, 2 (0) from enteric fever, 2 (0) from measles, 8 (2) from whooping-cough, 19 (0) from diphtheria, 43 (4) from diarrhœa and enteritis under two years, and 5 (1) from influenza. The figures in parentheses are those for London itself.

Ilford and Gillingham each reported a death from typhoid. Wolverhampton had 2 deaths from measles, Birmingham 3 deaths from whooping-cough. Fatal cases of diphtheria were scattered over 13 great towns, Sheffield reporting 3, St. Helens, Walsall and Plymouth each 2. Liverpool had 7 deaths from diarrhœa, Hull and Wolverhampton each 3.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM D.P.M.

IV

How are we going to fill in our spare time while Mr. Chamberlain and his colleagues are polishing off the Nazi regime? That is what institution dwellers are asking themselves at the moment. Herodotus records that during a shortage of corn the Lydians invented games; they had games all one day and no dinner, and the next day they had dinner but no games. He mentions dice, ball, and hucklebones among their inventions and adds that in fact they thought of all the games except draughts—which looks as though we have to thank the Lydians for snakes-and-ladders and ludo. However, after eighteen years even the Lydians got tired of this arrangement, so they drew lots and half of them moved out, leaving, presumably, a daily dinner for all. So much for the Lydians, as Herodotus would say; and as we may fairly hope for dinner as well as games we ought to be able to last out twice as long as they did.

The problem is not really frivolous. Nurses come off duty at seven in the evening; by eight it is dark, and soon they will have no daylight off-duty time at all. London, after dark, though perhaps not a wicked city at present, is certainly a dangerous one, as those who drive by night know. Many nurses wisely stay in the hospital, though now that the cinemas are open again they will have more occasion to risk their limbs. Still they cannot spend all their free time in cinemas, and there is little enough to occupy it in hospital. It would be a good opportunity for study had not even the mild excitement of the R.M.P.A. examination been taken from them. Nurses who have no practical use for the information sit like a row of unresponsive muffins before the sweating lecturer. "I can't seem to take any interest in this stuff now," one willing girl said sadly.

This interruption of education is, I suppose, inevitable; or is it? Have we perhaps overshot the mark again and been too careful? In the last war we certainly rushed a large number of nurses and doctors through their examinations in order to avoid a shortage, and perhaps this meant that the standard in the two professions fell a little—at least as far as theory went; practical experience was probably wide enough to outweigh this defect. The standard is just as likely to fall and to fall heavily it seems to me under the present system. If medical students and probationer nurses are to be kept in a state of suspended education for any length of time their enthusiasm is likely to evaporate. The Conjoint Board, with engaging phlegm, is carrying on with its examinations; perhaps we can hope that most of the other examining bodies will presently pluck up spirit to do likewise.

* * *

Common usage is said to be the final criterion in settling the meaning of a word, but the fate of the word "evacuate" at the hands of the common user, and even of the B.B.C., calls for a mild protest at the present time. I can see that it is possible to evacuate London, but is it really possible to evacuate a child—except by catharsis?

Anyhow, in one village they were waiting for their quota of these evacuated children; buns, chocolate, and bumpers of milk, designed I suppose to fill the vacuum, were laid out in the local school-room, and the matrons of the village had collected to welcome the little ones. Night fell and the matrons went home. Next day they came again, and the day after, but no children appeared. The milk had to be replaced, the buns got stale, and the less conscientious matrons began to nibble at the chocolate, now a little dusty. In the early days of the vigil speculation on the appearance of the children ran high, for each matron had applied for a blonde, blue-eyed female child aged five, and had expressed her determination not to be put off with a healthy boy of eleven or so with muddy boots. However, as the days went by decision faltered, and it was generally felt that the sight of any sort of child would make a welcome change. Finally word came that each of the neighbouring villages had double its quota of children, but that their own village had been overlooked; and owing to some regulation or other it was impossible to switch the excess children over into the empty village.

This story rather cheered me, as it looks as though we may be muddling along in the same old way after all.

* * *

I have just been hearing some facts, new to me, about ancient weapons of war. They seem encouraging. Most of us are inclined, I think, to compare modern warfare gloomily with the home-made efforts of our forbears, in the belief that we can now kill more people more cheaply, quickly and disagreeably than they could. However, as so often happens with scientific advances, we turn out not to have been very clever after all. The six-foot longbow, I am told, used by an expert loosed a clothyard arrow with a force of anything up to a hundred-and-fifty pounds, capable of piercing steel armour like cheese; moreover, being barbed and spinning it made a wound more commonly mortal than not. The knight hit by an arrow observed the rules of battle and gave no more trouble to the enemy that day; and even a charging lion is said to be stopped more certainly by an arrow than a rifle bullet. Bullets indeed move faster than arrows but are not mortal unless they hit you in one of the right places.

Then again, the method of joining battle in the past made for a high mortality-rate; you picked out some fellow on the opposite side and went on fighting him until one of you lay down. This ensured a fifty per cent. mortality in every single-combat, with a chance of raising the figure to a hundred per cent. by the time the army surgeon had done with the victor. These would be regarded as impossibly high figures in modern war. I recall one of *The Lancet* staff telling me that whenever he read about the peasantry going out armed "only with bills" his sympathy was strongly with the enemy. Clearly they would be less dangerous if armed only with machine guns, which require an expert to use them.

And finally civilians may recall for their comfort that when our forefathers took a town they sacked it; and sacking was sacking in those days; there was no talk about sparing the women and children or respecting the Red Cross or anything of that kind. They made the party as unpleasant as possible, and

it was the more unpleasant to my mind because it was held at close quarters. Death was not sprayed impersonally from the air; you saw your fellow man drunk and distorted and mad, carrying out deeds which would be dreadful to him ever after. How much more agreeable to receive a bomb through the roof of your own home as you sit among your family doing the evening cross-word. And in any case the chances of being hit are far smaller than the chances of not being hit, while the chances of escaping attention during the sack of a city must have been poor. In fact if we can put up with the bangs we shall have very little to complain of, thanks to the march of science.

* * *

A Spanish girl who has been watching the air-raid precautions in one of the outlying shires cannot get over her amusement at our concern for ourselves. The Spaniards carried their war, it seems, with a lighter touch; they popped into the local cinema on their way out of a crumbling town, and when they used gumstrip they used it coloured, and stuck it on their windows in fancy patterns. So far I have seen no advance on the Union Jack in window decoration over here; it makes one feel rather shamefaced. "Surely," someone said to me the other day, "this is not the way that England used to go to war?"

No, this is a new way, certainly; and of course in some respects a better one. There is no cant, no cheering and no chat about glory this time, for which we must all be thankful; but on the other hand there is this dreadful solemnity, as though we thought we mattered. It makes one wonder how we became so inflexible, and whether invasion by a lot of total strangers would be quite the disaster we all imagine. Though heaven forbid it should be a German invasion: the Germans are too much like ourselves in being willing to submit meekly to a mass of regulations. What we want is a change, and I can't help thinking it would do us no harm to be invaded by the French; they have such a good sense of values and are not preoccupied by the trivial in government. It is nearly a thousand years since the last French invasion of this country, and the old Anglo-Saxon has got the upper hand again. How the Normans must have enjoyed upsetting the old English customs, shocking the local dignitaries and bringing their vulgar candid wit to bear on Anglo-Saxon politics. The trouble is, however, that if people live long enough in England they become English; I think it must be something to do with the climate; they become—roughly speaking, of course—rather grave and sentimental, with a simple faith in British institutions. At the moment our simple faith seems to have got the better of our Norman blood, and it has not needed a war to bring this unfortunate fact to light. We have been growing too well-regulated for a long time now, multiplying restrictions on eating, drinking, smoking, parking and crossing the road until we expect to be told how to carry out the most elementary processes. I remember once being asked—not by *The Lancet*—to write an article on "How to Breathe."

Our chances of a French invasion are of course rather slight at present, but the strain we inherit from that race of brilliant realists should help us to shake off our present mood of fussiness; or what is to become of the famous "sangfroid habituel" which the schoolboy had trouble in translating?

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

REGIONAL OBSTETRICAL SCHEME

THE Department of Health for Scotland has organised a regional obstetrical service for areas distant from the large hospital centres. Obstetrical consultants have been appointed to organise and run hospitals in Dumfries, Inverness and Perthshire. The service is designed as a war-time measure for the care of pregnant women who have been evacuated from the danger areas of Edinburgh, Glasgow, Clydebank, Rosyth and Dundee, in addition to those already living in the reception areas. In peace-time pregnant women have when necessary been sent to the large hospital centres, or consultants have travelled from these centres to the smaller towns. In war-time, however, transport of either patients or doctors is difficult or impossible, and further the local practitioners are already overworked owing to the depletion of their numbers. Hence the need for the new scheme. The Dumfries service is designed to cover not only the town but also the counties of Dumfries, Kirkcudbright and Wigtown; because of the difficulty of reaching the patients' homes as many as possible will be brought in to the regional centre for delivery. Antenatal clinics will probably be set up in several smaller centres. Dr. J. Bruce Dewar has been appointed for whole-time work in Dumfries, Dr. Caroline Elliot for Perthshire, and Dr. T. N. MacGregor for Inverness.

MEDICAL EXAMINATION OF EVACUATED CHILDREN

Many complaints have been received from reception areas about evacuated children having been sent without adequate medical examination. The inevitable cases of infectious diseases have cropped up, but the chief complaints have been of scabies, pediculosis, ringworm and impetigo. Householders have stated that bedding and furnishings have had to be burnt. Taking the evacuation as a whole, these are minor if unpleasant worries and they must be put down largely to the suddenness of the exodus and the time that Hitler chose—just at the end of a long holiday before the school medical authorities had an opportunity to examine the children. Further evacuation is only likely to be carried out in small groups, and assurances have been given that the children will be examined and their equipment attended to before they leave their home towns.

CERTIFICATION OF DEATHS

SPECIAL arrangements have now come into force for the certification of deaths due to war operations. Bodies not claimed by relatives will be taken to a mortuary, and the clerk to the council will send the registrar a certificate that death was due to war operations. In the case of serving sailors, soldiers or airmen, and of certain classes of civilians employed with the armed forces, commanding officers are authorised to issue a certificate. The ordinary procedure will apply to other deaths. A medical practitioner who was in attendance on a deceased person prior to death should issue an ordinary death certificate and should add the words "war operations" to the particulars of violence. When no doctor has been in attendance before death the relatives may request one to inspect the body and issue a certificate, and if he is satisfied that death was due to war operations, he may do so. He should complete the ordinary certificate, deleting the words "last seen alive by me" and "not seen," thus indicating that the deceased was seen after death but not before. Whether the doctor has been in attendance or not there will be no need to report these deaths to the coroner and no inquests will be held on them.

LETTERS TO THE EDITOR

THE WAR AND THE R.M.B.F.

SIR,—In spite of the unprecedented difficulties which members of the medical profession are experiencing owing to the war, may I appeal through you, Sir, to all our regular subscribers, who have not yet sent in their contributions to the fund for the current year, to do so now or as soon as possible. If we are to do our part, as the profession will expect us to do, in continuing to help our aged beneficiaries, and also those who may suffer privation owing to the war, it is vital that we should receive financial support not only from our regular subscribers but from every member of the profession.

Cheques should be made payable to the Royal Medical Benevolent Fund and sent to Wormingford Grove, Wormingford, Essex.

I am, Sir, yours faithfully,

LEWIS G. GLOVER,

Sept. 18. hon. treasurer.

MEDICAL CARE OF CHILDREN IN THE RECEPTION AREAS

SIR,—Since we have evacuated children from our larger cities to save them, if possible, from the risk of bombs, we needs must act quickly to minimise the possible toll of disease. To organise the medical services of the nation in face of this vast dislocation of the life of the people was a superhuman task. So far the bombs have not descended on us. May we take advantage of this breathing space to deal with some of the more obvious gaps in our medical arrangements? Of these, one is certainly medical provision for children in the reception areas; another (with which I am not concerned in this letter) is provision for children in London, where thousands of children remain. Let alone the risk of epidemics in rural areas resulting from the mass migration of children, we need to bear in mind that the children are of necessity often billeted in the houses of persons with scant knowledge of children, healthy or sick, and also that scattered in country districts are many hundreds, nay thousands, of infants and children who, but for the war, would be inpatients in city hospitals or under skilled supervision in outpatient clinics. Moreover, mothers of artificially fed babies in country districts are likely often to be unable to get the particular dried milk or infant food with which they are familiar—a small point one would say, but infants may quickly come to grievous harm from want of some elementary instruction in feeding.

It is said that some mothers are bringing sick children back to London because they hope thus to get the medical help to which they are accustomed, and children with minor infections have in some instances been sent back to London by local authorities for treatment. There is at present not only a shortage of medical help in rural areas, but the health visitors and school nurses of London who would normally be concerned with the welfare of the children have been drafted to other work in first-aid posts and hospitals.

Presumably the authorities will aim at providing in the reception areas:

(1) Clinics for infants and children of all ages at which advice will be given and minor conditions treated.

(2) Clinics with facilities for laboratory and other investigations.

(3) Inpatient accommodation with full hospital facilities.

(4) Beds for sick children unlikely to require more than simple nursing and medical supervision.

(5) Beds for infectious diseases.

(6) Treatment by general practitioners.

Of arrangements to provide (1) to (5) I know nothing, except that in one sector a pædiatrician has been appointed to take charge of thirty-odd beds for children (when these are available) and presumably to start clinics; (6) must of necessity take some time to organise. Meanwhile so far as I gather most London pædiatricians are unemployed, whether they are sitting at home or are called up to act as general physicians at empty base-hospitals. Cannot they be utilised at once in their own sphere, to set up what we may call pædiatric units in the various sectors or other reception areas and to form the skeleton of the required services other than the general-practitioner service?

To begin with they might institute clinics, some in village halls, some at hospitals, some perhaps in empty houses which might eventually form small hospital units on the model of school sanatoria. Their services would be available when epidemics appeared in schools. On such beginnings a more adequate medical provision could be built up. Each pædiatric unit might consist of the pædiatricians allotted to the sector or county, a central dispensary and store, and a central laboratory or a share in such a laboratory. A travelling dispensary van and dispenser would be an asset. As the scheme developed the help of an orthopædic surgeon, psychiatrist or other specialists might be enlisted, or existing orthopædic clinics would no doubt assist. Naturally the whole of the work would have to be coördinated with that of the medical officer of health and the local medical emergency committee. Beds for sick children (both in fully equipped hospitals and probably in small groups in villages) are likely to be required on a fairly large scale, as temporary hosts will often be unable or unwilling to accept the responsibility of a sick child, and the pædiatric unit should be available to give help when needed for any such beds.

Our health services for children in peace-time have suffered from the divorce between hospitals (voluntary and municipal), school medical service, child-welfare service and general-practitioner service. May this prove an opportunity for linking up some of our work for child health in the reception areas.

I am, Sir, yours faithfully,

HELEN M. M. MACKAY.

London, Sept. 18.

MONOCYTIC ANGINA?

SIR,—I have read with interest the account of a case of monocytic angina treated with M. & B. 693, recorded by Drs. Hugh Stannus and Marshall Findlay in your issue of Sept. 9. The prime interest of their case lies, of course, in the transmission of the infection to the rhesus monkey, as a further step in the ætiological investigation of the disease. But they also stress the dramatic—this overworked word must still be used for many results of sulphonamide therapy—cure brought about by M. & B. 693, though they point out that the action of the drug may only be on the secondary throat-invaders. For a striking feature of some cases of monocytic angina is the late period of onset of a severe throat lesion, which does suggest a secondary invasion of weakened tissues. I have recently had under my care a typical example of this disease, similar in most respects to that described by Stannus and Findlay. A large mass of glands in the right side of the neck, developing a week before the severe tonsillar infection, gave an early clue to the diagnosis and suggested the advisability of a blood-examination; the latter revealed a marked increase

in the mononuclear cells. Eventually the throat condition became much worse, with temperatures up to 104° F., and the patient appeared very ill indeed. Treatment with M. & B. 693 orally in full doses was instituted at this stage, and the clinical picture completely changed in 24 hours.

Monocytic angina is a strange clinical syndrome, presenting varying pictures. The prodromal symptoms are vague: malaise, headache which is often severe, slight pyrexia, occasionally epistaxis, and usually a slight soreness of the throat. The diagnosis can hardly be suspected until the adenopathy appears, and it is obvious that a correct diagnosis must often fail to be made; many cases, I imagine, are labelled Vincent's angina, since the textbooks state that severe throat involvement is rare in monocytic angina. But the appearance of the cervical adenopathy *before* the throat signs or symptoms are at all conspicuous should suggest immediate examination of the blood.

I fear that before very long the precise diagnosis will have only an academic interest, for who can resist giving a sulphonamide derivative to the non-diphtheritic "throat"? No thoughtful clinician likes to see his obscure pyrexia cured by hit-or-miss therapy before he has arrived at a diagnosis, provided his patient is not deteriorating; but this academic catastrophe must be happening every day with a drug so wide in its therapeutic actions as M. & B. 693. However, we are gradually learning what infective processes are not aborted by the drug, and thus its exhibition is coming to have a value in diagnosis, as well as in treatment.

I am, Sir, yours faithfully,

Liverpool, Sept. 11. RONALD ELLIS.

REGIONAL ORGANISATION

SIR,—War will probably make a national medical service a necessity. Those who have desired and worked for this in peace-time may now have an important duty. Opposition has been based on two fears, firstly of bureaucracy, secondly of financial loss by some individuals. The second will no longer count for much if, as one hopes, some method is found of ensuring that inevitable reductions in standards of living are fairly distributed (it would be shameful if the heaviest losses were suffered by the families of those whose lives were at greatest risk on active service and war were made a source of profit to others). Paradoxically, peace-time advocates of a comprehensive service who saw the risks of administrative bureaucracy and tried to avoid them in their plans are likely to see their former opponents accept any sort of regimentation without demur now that their patriotism is obviously involved. Conscription of doctors is a necessity, but authoritarian organisation is not. Regional organisation based on hospital and public-health centres will almost certainly develop; such centres should have the greatest possible degree of local autonomy on a representative basis, and acting medical staffs of all grades should have both a consultative function in policy and the greatest possible freedom of individual professional action. The war committees of the British Medical Association, which are representative of the profession, should be able to play a critical part in ensuring that the principle of freedom of professional conduct is upheld as strongly as necessity allows, and that place-seeking, nepotism and arbitrary exercise of authority are reduced to a minimum.

I am, Sir, yours faithfully,

B. LEYS,
Consulting Physician, Royal Northern Infirmary and Highlands and Islands Medical Service.

Sept. 13.

PREVENTING VACCINATION SEQUELÆ

SIR,—At the present time large numbers of persons will necessarily be vaccinated. I would stress the importance of disinfecting the pustular mass on the sixth day after vaccination with potassium-permanganate compresses. The results of such compresses are first and least important a black scab, secondly a material reduction in discomfort, and thirdly a considerable lessening of septic sequelæ. By experiment it has been shown that if a subject be vaccinated daily, on the fourth or fifth day the vaccination ceases to take; also if the vaccination area be excised on the fifth day subsequent vaccination does not take. Vaccinal immunity is therefore established on the fourth or fifth day, and nothing is lost by disinfection of the vaccinal area on the sixth day. The advantage of so doing is substantial. The technique is really an extension from the well-known treatment of smallpox with potassium-permanganate baths.

I am, Sir, yours faithfully,

West Wickham, Kent, Sept. 9. R. W. JAMESON.

A WAR-TIME PHARMACOPŒIA?

SIR,—Mr. Davis suggests that a war emergency pharmacopœia should *now* be devised. It may be useful for it to be known that machinery was set up some time ago and plans are already well advanced for the production of a revision of the British Pharmacopœia. This will include substitutes for many foreign proprietaries in common use which can equally well be produced in this country once the patent and trade-mark rights on them have lapsed. It can be confidently anticipated that the Board of Trade will cancel certain foreign patent and trade-mark rights, as was done in the last war, and there is no doubt that the machinery of the General Medical Council, which is already in being, will be able to introduce these substitutes with very little delay should it become necessary to do so. The G.M.C. will also give, as they did in the last war, attention to the conservation of supplies of essential items of materia medica and the eradication of non-essentials. The Ministry of Health have also been giving attention to the conservation of supplies of essential drugs.

Regarding formularies, it will be appreciated that the existing pharmacopœias of some of our larger hospitals are specifically designed to combine the greatest economy compatible with the maximum therapeutic efficiency. The National Formulary also follows these lines to some extent, although further economies could probably be effected. In the meantime, however, medical practitioners could give invaluable assistance by adhering strictly to published formulæ and by refraining from prescribing proprietary articles, particularly those of foreign origin.

I am, Sir, yours faithfully,

JAMES COUTTS,
Sept. 16. Pharmacist to St. Bartholomew's Hospital.

MALARIA THERAPY CENTRE AT HORTON

SIR,—Of recent years many cases of neurosyphilis have been treated by malaria therapy in the London general hospitals. Those facilities for treatment no longer exist. I am writing to say that the Ministry of Health, in conjunction with the London County Council, have made arrangements for the malaria therapy centre at Horton Hospital, Epsom, to continue. Accommodation can be provided for private patients (at an inclusive cost of 4 guineas a week), voluntary and certified patients. All rate-aided patients should have a London settlement. Inquiries regarding possible admission should be addressed

in the first instance to the M.O. in charge of Malaria Therapy Centre, Horton Hospital, Epsom, from whom the necessary application forms for admission can be obtained (Telephone number Epsom 9872).

I am, Sir, yours faithfully,

W. W. NICOL,
Medical Superintendent, Horton Hospital.

Epsom, Surrey, Sept. 18.

THE BLACK-OUT: HABIT AND STALENESS

SIR,—We must all do our best to make the black-out effective for its purpose. The Prime Minister says that the restrictions are required on strategic grounds and are the result of long experiments by the R.A.F. They are "for the moment inevitable"; "preparations for blacking-out at the last minute would be too late"; "lighting in remote areas would be a signpost to built-up areas." Changes cannot easily be made "until actual air-raid experience" has been gained. At the same time we have already some relaxation as to hand torches and masks for headlamps.

It seems to me most important that the black-out should still be under day-to-day consideration and should even be subjected to further experiments by the R.A.F. The state of affairs in the sky must not be divorced from that on the ground. Living in a country district, I am perhaps naturally more concerned with the latter at the moment. With short days approaching, a certain amount of transport must move after dark. For instance, our food comes entirely from a big London stores, at present on five days a week, in future on two. Can their staff complete their round in two-fifths of the time without risk of breakdown in health of the drivers if the strain of moving after dark is substantial? Similarly, can doctors perform their essential duties? Special care is now needed by day and night on the roads owing to the increase of bicycles; in my locality they are sold out. They are an additional difficulty to motor drivers. Children must somehow or other be fetched from schools. Schools will probably close early, but my children have to go 5 miles, and with reduced train and bus services and a walk of 2 miles at one end and 1½ miles at the other, it is going to be a hard job to get them home before dark.

At first sight, it seems sound sense to tell people to keep off the roads unless they have urgent errands. But the morale of the population must be maintained, and people can hardly be expected to be kept in isolation indefinitely from friends, relatives and entertainments after the day's work. Some evening family meetings for bridge or even gossip will ease the difficulties of economising in fuel and light (you come to me once a week and vice versa).

I suppose it is impossible to give the harassed householder any standards. If he has darkish curtains, no shaft of light shows; at, say, 10 yards you could tell there was a light behind the curtains, but not at 30. Does this really matter? The evenings have to be passed somehow, and many people are now trying to read and sew by inefficient light.

There is still another point which demands consideration. No doubt it was imperative to make householders and the users of cars expert in the prophylactic measures necessary in an air-raid, but that knowledge having been inculcated (and incidentally all the more light-hearted traffic having been ruled out of the running), is there not a risk that the maintenance of strict precautions over a long waiting period will defeat its own end? Will not slackness and carelessness arise? And would it not now be better to relax the code, on the understanding that it is instantly and automatically applied in the face of danger? Habit and fatigue are not subjects new to the industrial psychologist. Is it not possible that in the work of the Industrial Fatigue Research Board and its successor, a useful precedent may be found? If psychologists can answer these questions in advance of actual and possibly painful experience, so much the better.

I am, Sir, yours faithfully,

COUNTRY GLOW-WORM.

Sept. 14.

DR. CHARLES MILLER

A MEMBER of the staff of University College Hospital writes: "In 1937 our hospital was faced with the retirement of its only remaining physician of mature years. The desire to obtain the experience and stability of a senior man was translated into an invitation to Charles Miller to become senior physician for what would have amounted to 3½ years until he reached the usual retiring age. It was not expected that his appointment would call for any great effort on his own part, and it was hoped that his mature judgment would in itself be sufficient justification for this unusual invitation. But Miller proved to be very much more than a mature mind; his drive, his personality and his kindness quickly secured for him an affection that could not have been greater had he devoted his whole life to the hospital.

"He never missed his ward rounds or outpatient clinics and returned to the problems of teaching with great enthusiasm; his attendance at committees was regular and his opinion always frankly expressed. Dr. Miller had an almost uncanny habit of scenting out clandestine wrongs, and bringing them into the open to put things right; whether the matter affected nurses, patients or students he could not tolerate anything that was unjust or unkind.

"As senior physician in a strange school he may sometimes have felt his position to be difficult; it is to be hoped that he realised to the full the affection which he so quickly achieved of colleagues, nurses and students. His experience and friendship were freely at the service of all his juniors, many of whom have reason to remember with gratitude his help and advice. His death has taken from us a much-loved man."

DR. LEONARD WILLIAMS

Dr. AGNES SAVILL writes: "With the death of Dr. Leonard Williams there has passed away a picturesque personality who will be sadly missed by a large circle of friends and patients. The public knew him by his emphatic views on diet and his scathing denunciations of the over-athletic and bedizened examples of modern girlhood who neglected the finer qualities of womanhood which he held in veneration. He never hesitated to flay his opponents with a peculiarly pungent pen, but even his victims enjoyed the perusal of their castigation in witty and beautiful prose. He had the artist's appreciation of beauty, particularly in the choice of words and phrase in writing and in oratory. His naturally beautiful speaking voice added to the attraction of his stimulating conversation and public speeches. The latter, often given in French and German, and always with unhesitating eloquence, used to captivate his medical audience. Because he lived beyond the allotted span it is now forgotten that he was a pioneer: several years before the late war he introduced small doses of thyroid and other endocrine glands and became a strenuous advocate of the use of raw and fresh foods. What has become a commonplace to-day was advocated by Dr. Williams many years before science had heard of the vitamin content of such a diet."

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

THE House has now got into a regular war-routine. The Prime Minister makes a weekly statement on the conduct and progress of the war and on this matters of policy come under review by the House. Questions also have resumed their place on the order paper, and by means of questions any matter of special or local importance can be brought up and ventilated. This is where the art of the supplementary question is displayed, for this can be framed in a way which would not "get past" the scrutiny of the wording which all printed questions undergo. The scrutiny is to make sure that questions come within the rules of order and the rules of the House. Broadly, this means that they must be questions addressed to the Minister concerned on matters which are his concern and not, for example, the concern of a county council or a private organisation. Great use is being made of the "motion for the adjournment" in order to facilitate debate. It is on this motion that the Prime Minister makes his statements and on which any general matters of policy can be discussed.

Opposition in the sense of Party opposition on peace-time lines no longer exists. The Opposition has become the constructive critic of the Government's proposals and actions and the guardian vigilantly on the watch against any infringement of civil rights or liberties.

* * *

Criticism in the House of Commons is very free and in the last week was expressed with emphasis on two important matters. Firstly there was criticism of the Ministry of Information and the censorship whose actions in censoring the publication of the news of the presence of British troops in France—which had been announced to the world at large on the French radio—caused the confiscation of daily papers already printed and quite needless expense, confusion and irritation. The responsibility for this was attributed by Mr. Greenwood, who is leading the Opposition with conspicuous vigour and ability, to the Minister of War, and it is very desirable to have this freedom of criticism and discussion to bring such matters to the light.

Another useful discussion was that on the education of school-children and the evacuation of mothers with children under five and expectant mothers to the rural and other reception areas in Great Britain. The debate made it clear that the two problems are distinct. Speaking generally, the evacuation of children of school age has proved very successful. The reception areas have provided for the children very well, the vast majority of them are happy and contented and the minor personal difficulties are being adjusted by that tact and understanding for which the Minister of Health has pleaded in a circular sent to all local authorities.

In the debate too much attention was focused on the occurrence of verminous conditions among the children. Unfortunately, in a proportion of school-children for all areas some verminous cases are found. Naturally enough, the evacuation of these children has turned a spot-light on their condition, and the unfortunate householders upon whom these verminous children have been billeted have experienced at first-hand the conditions which are bred out of the least well-cared-for stratum of the population. The facts are of course well known to doctors, but they have come as a shock to the dwellers in many pleasant villages and little county towns.

A number of cases were mentioned in the House where evacuees had such filthy habits that they used their bedrooms or other rooms in the home where they were staying as a latrine. It would be interesting to know how widespread this was and how many cases were actually involved. Probably the total number in the county could be counted in tens. But why did such things occur? Was it the psychological effect of the uprooting from the town, the journey to a sometimes remote county area, the darkness of the country and the absence of the familiar water-closet—or are the cases of subnormal type? Complaints come from parts of the country as wide apart as East Anglia, Wales and Scotland, but the actual numbers were certainly small.

* * *

It is clear that the shifting of population from the towns to the country—and of a predominantly child population—will necessitate the setting up of medical and nursing services and of clinics on a scale unprecedented in rural areas. The desirability of a communal mid-day meal was stressed in the debate and by the Minister of Health in the circular sent to local authorities. And it was suggested in the debate that this meal should be so balanced as to constitute, with the normal breakfast and tea meal obtained in the billets, an optimum diet from the medical point of view. With the larger number of children of the nation in the country areas the opportunity occurs of greatly improving their physique and using the war period as one in which the children of the nation will be brought up under ideal physical conditions. The education services in the country will also need to be remodelled, and steps towards that are already being undertaken.

One gets from these debates in the House a picture of vast forces at work remoulding the national life. If the daily life of the school-children can be put on a sound and healthy basis, as now seems possible, we shall equip the young generation in a way that no whole generation has ever been equipped before. It is true that as at present arranged these optimum conditions, even if established, would cease at 14 or 15. But there is already a good prospect of improvement in the living conditions of adolescents. Optimum conditions of these young people also would give a "peace" reserve of a new generation to take up the tasks which will fall to the world when the war is over.

FROM THE PRESS GALLERY

Public Health Aspects of Evacuation

IN the House of Commons on Sept. 14 a debate took place on evacuation. There was general agreement that the manner in which it had been effected reflected on the whole the greatest credit on all concerned, but there was some criticism of points of detail. Mr. EDE mentioned cases where sanitation and water-supply were giving concern to the local authorities. Mr. STEPHEN urged that in future the Government should see that each authority evacuating children appointed a responsible official to examine all the billets, and that evacuated children were provided with proper clothing and boots and shoes. Captain THORNTON-KEMSLEY said that complaints had reached him that children and their mothers had been evacuated in a verminous condition and inadequately clad. Medical officers and sanitary inspectors should see that people of this kind were

evacuated in a clean state, or else sent into some sort of communal billets. Care was also needed to see that where evacuated people made their own arrangements for feeding their children the money provided was actually spent on food for the children. He knew of cases where the money had been spent on "red biddy." These people should be given coupons exchangeable for essential foodstuffs instead of money. Major OWEN gave details of similar experiences in North Wales. In some cases, as a result of the filthy habits of the evacuees, bedding, clothing, and even blinds and curtains had had to be destroyed. It was hard that there was no compensation for the losses endured by the people in these reception areas as a result of the lack of care and attention on the part of the medical authorities in the city of Liverpool. Some of the evacuees had been sent out suffering from scarlet fever, diphtheria, and mumps.

Mr. COLVILLE, Secretary of State for Scotland, said that he would like to believe that none of the stories was true about children being evacuated in an unclean condition, but he was afraid the evidence was that there were a number of such cases. Except in the event of serious air-raids and burnings, every possible step would be taken in future to ensure that no child would be transferred to a billet in a verminous condition. If it was necessary to remove a child who was not free from infection or disease he was anxious to make arrangements for the reception of such a child into an institution or other place where it could be properly attended to.

Dr. HADEN GUEST said that anyone who would take the trouble to read the reports of school medical officers in such places as Glasgow, London, Edinburgh, and in fact any town in the country, would find that unfortunately there was always a proportion of children who were verminous. On the whole, so far as the unaccompanied school-children were concerned, the evacuation had been an outstanding success. It was unfortunate if the rooms of houses in the reception areas had been fouled by persons using them as latrines, but the explanation might have been a psychological disturbance due to the evacuation of people to unfamiliar surroundings. These were abnormal cases which would be rectified as soon as people got to understand their new quarters and the usages which prevailed in country districts. He urged that they should aim at giving every child from the town districts not only a good diet, but the optimum diet laid down by the medical authorities as necessary for the child's development. He had carried out a feeding experiment many years ago and found that it was possible to concentrate the major nutritive foods in the midday meal. Boots and clothes should be provided through the school authority and paid for by the parents in instalments.

Mr. RONALD TREE said that provision should be made for children between the ages of one and five on a nursery-school basis. This system was an answer to a great many of the problems arising in homes where parents had not had a chance to teach children habits which they should form when they were very young.

Mr. MCENTEE said that in Rutland it was impossible to provide for the evacuees free milk and cheap milk and other services to which they had been accustomed in the town areas from which they came. The Government might advise the larger local authorities to transfer their services where they could be effectively used for the children.

Mr. ELLIOT, Minister of Health, said that the evacuation scheme on the whole had been a considerable success, but he admitted that they had had experiences from which they ought to learn. In circular No. 1871 the attention of local authorities had been drawn to the matter of the inspection of children. The Government would do their best to deal with the public health aspects of the case. The arrangements for providing evacuated children with medical attendance had been made with the coöperation of the British Medical Association. Any householder with whom an unaccompanied child was billeted might, without expense to himself, call in a doctor if he thought it necessary. The Government felt that the general principle of asking parents to make a reasonable contribution towards these expenses was sound. The suggestion that children under five should as far as possible be treated on the creche system, large or small, was one which the Government welcomed and to which they had called attention in their circular.

Medical Services

In the House of Commons on Sept. 13, in the course of a statement on the war situation, Mr. CHAMBERLAIN said that some 200,000 hospital beds had been made available for the reception of civilian air-raid casualties. These beds, of course, were also available for service sick and casualties and a certain proportion of them were now in use for that purpose. It was also a part of their scheme that these hospitals should continue to admit ordinary acute surgical or medical cases amongst the general population. This "reflux" was now taking place and would continue. Any patient whose medical condition required inpatient treatment should be able to obtain it. These cases would naturally encroach upon the number of beds immediately available for the reception of casualties, but that was being met by increasing the numbers of extra beds, by pressing forward with the building of hutted wards, and by providing further temporary accommodation in large tents, so that in spite of fresh admissions the number of beds immediately available had been maintained at the figure of 200,000. Furthermore, they had asked that outpatient facilities for the ordinary civilian sick should be maintained and this was being done. The first-aid posts, both fixed and mobile, had been in general duly established and equipped and the emergency ambulances had been assembled and fitted up. Motor coaches in the provinces as well as in London had been converted for use as inter-hospital ambulances. The full complement of casualty evacuation trains for civilian cases had been assembled and staffed and provided with medical equipment. Some shortage of extra beds, bedding, dressings and surgical equipment had been reported from a number of places, but this was being met as rapidly as possible by accelerating the delivery of goods on order, by the diversion of supplies from places more favourably situated and by placing fresh orders. In particular, surgical instruments were now being delivered in considerable numbers and others had been obtained on loan from hospitals and surgeons having a surplus available.

University Finance

In the House of Commons on Sept. 13 Sir DONALD SOMERVELL (Attorney General) moved the second reading of the Universities and Colleges (Emergency provisions) Bill. He said that part 1 applied to the universities of Oxford, Cambridge, and Durham, and the colleges and halls within those universities, and the colleges of Winchester and Eton. These were the institutions which were dealt with by the Universities and Colleges Estates Act, 1925. Part 2 applied only to the universities of Oxford and Cambridge and to their constituent colleges, and provided for alteration of procedure applicable to those institutions as laid down in the Oxford and Cambridge Act, 1923. This bill was similar to an act which was passed in 1915. The result of war conditions on these institutions would be a substantial loss of revenue; fewer students meant less fees and dues. Part 1 enabled the various bodies to draw on the future for the needs of the present. Other universities had similar problems which would require separate legislation. Clause 1 of this bill enabled the institutions to borrow not only the capital charges but also to make good any deficiencies in revenue due to war conditions, and clause 2 enabled the period of repayment of existing loans to be extended. The bill also empowered these universities and colleges to make emergency statutes.

QUESTION TIME

SEPT. 13–15

Standard of Accommodation for Evacuees

Mr. PARKER asked the Minister of Health whether any general standard of accommodation had been laid down for evacuees in reception areas; and whether children could be removed from unsuitable dwellings—Mr. ELLIOT replied: The standard generally observed in billeting evacuated persons is on the basis of one person per habitable room. It may have been necessary to exceed this standard as a temporary measure, but redistribution from overcrowded districts is now taking place. Local authorities in the receiving areas have been instructed to set up welfare committees to supervise the general welfare of evacuated children and see that they are not left in homes found to be unsuitable.

Cod-liver Oil

Mr. LAW asked the Chancellor of the Duchy of Lancaster, whether, in view of the evacuation of children and nursing and expectant mothers, steps had been taken to ensure that adequate supplies of cod-liver oil were available in the evacuation centres—Mr. W. S. MORRISON replied: There are ample supplies of cod-liver oil to meet all requirements, and I understand that the reception areas are obtaining the full quantities they need through the usual channels.

Enrolment for National Service

Mr. GRENFELL asked the Minister of Labour what steps should be taken by persons who wished to offer their services upon work of national importance, whether paid or unpaid—In the course of a circulated statement in reply Mr. E. BROWN said that members of the medical, dental or pharmaceutical professions should not apply to the Central Register, but should consult the appropriate professional organisations if they desired advice or guidance.

Emergency Medical Services

Mr. PARKER asked the Minister of Health whether he was aware that there was great discontent in the emergency medical services arising out of the fact that many nurses, medical students, doctors and others were expected to give their services voluntarily or for purely nominal remuneration; and whether he would examine and rectify these grievances—Mr. ELLIOT replied: No, Sir, I am not aware of any such discontent. We have in this country a great tradition of voluntary service to those in need, and those who give such service, whether in peace or in war, are rightly proud of it. Standard rates of payments have been arranged for doctors, nurses and nursing auxiliaries employed wholetime in the service. With regard to medical students, I understand that in general they are most willing to assist in the treatment of casualties, and I cannot believe that they wish to profit by the circumstances of the war.

Replying further to Mr. Parker, Mr. ELLIOT said that he would undertake to investigate any grievances brought forward.

Regional Commissioners

Replying to Sir HENRY MORRIS-JONES, Sir JOHN ANDERSON said: The Regional Commissioners have now been charged by warrant with a responsibility of ensuring that the civil defence plans of the government departments and local authorities are properly coördinated. Under present conditions they are not invested with specific powers, but they are in a position to use their influence to secure the completion of local civil defence preparations and the smooth working of measures already in operation. In the event of a breakdown of communications the commissioners, in consultation with the regional representatives of government departments, will exercise the powers vested in His Majesty's Government until communications have been satisfactorily re-established.

Sir H. MORRIS-JONES asked whether the rt. hon. gentleman would assure the House that the present democratic system of local authorities would function until there was lack of communication.

In reply to a further question Sir J. ANDERSON said: I understand that the normal system is working, but that it has been most usefully and valuably reinforced by the addition of an emergency organisation held in constant readiness to function in the event of any interruption.

The Minister, he added, had an overriding authority over the commissioners.

Sir FRANCIS FREMANTLE: Does not the Minister recognise the great confusion arising from the use of the words "Regional" and "Regional Commissioners" when the Minister of Health is always referring to the regionalisation of the Ministry of Health?—Sir J. ANDERSON: There should be no confusion. Regional commissioners have been appointed for the twelve areas into which the country has been divided, and partly in consequence of that plan the arrangements by which the different ministries concerned in civil defence carry out their local functions have been brought into line, so that the Ministry of Health and other departments have a regional representative at the headquarters of each regional commission. That makes for the elimination of delays.

Production of Medical Supplies

Mr. PETHICK-LAWRENCE asked the President of the Board of Trade whether he would give an assurance that in placing restrictions on normal production he would give sympathetic consideration to all forms of medical supplies and of supplies intended to relieve physical defects, including, in particular, high-tension batteries used in the latest implements for the deaf—Mr. STANLEY replied: It is not possible to give any guarantee as to the treatment of any particular class of goods, but every endeavour will be made to give due weight to every reasonable claim.

May I take it that sympathetic consideration will also be given to other parts, such as cords, condensers and other things required for the implements—Yes, Sir.

Powers for the University of London

Sir ERNEST GRAHAM-LITTLE asked the parliamentary secretary to the Board of Education whether, in view of the membership of convocation of the University of London exceeding 17,000 graduates, he had considered giving relief by legislation to the authorities of convocation from their statutory obligation of convening convocation for the conduct of elections to the senate and other offices or for ordinary meetings during the present crisis—Mr. KENNETH LINDSAY replied: A bill is already before the House giving the Universities of Oxford and Cambridge a general discretionary power to make emergency statutes and this power makes possible the suspension of normal statutory obligations. The most convenient way of meeting the difficulty raised would seem to be that the University of London, perhaps in common with other universities, should seek similar powers.

Hospital Treatment of *Athenia* Survivors

Mr. ROBERT GIBSON asked the Secretary of State for Scotland how many survivors from the *Athenia* were received into hospitals on arrival ashore; into what institutions they were received; and how many were still receiving treatment—Captain MCEWEN, under-secretary, replied: 30 survivors were admitted to hospitals in Scotland on landing. Of these 19 were admitted to the Western Infirmary, Glasgow, 2 to the Victoria Hospital, Glasgow, and 9 to the Royal Infirmary, Greenock. Thirteen are still receiving inpatient treatment. The Secretary of State would like to express his appreciation of the prompt measures of assistance carried out by individuals and public bodies in Glasgow and Clydeside.

Extension of Summer-time

Replying to several questions Sir JOHN ANDERSON said: I am not yet in a position to announce a decision. If summer-time is to be prolonged beyond Oct. 8 the question what should be the terminal date requires careful consideration, and inquiry into that question is still proceeding. I hope to be able to make an announcement shortly.

. . . . IN ENGLAND—NOW

(FROM OUR PERIPATETIC CORRESPONDENTS)

HAPPENING to Guy's yesterday I found many garden games going on in the "Park." Much of this has been converted into an elaborate fortification and the engineer may be commended for his power of improvisation. Some time ago he built a new chimney for the works, and had the old one, an iron tube, lying in the yard. This was in sections which he unbolted and cut each section longitudinally. He then had his trenches dug six feet deep and of such a width that his half tubes fitted on the top. When these were in place earth was piled on them and sandbags fitted over all to prevent the earth loosening. The entrances were then improved with further sandbags. All this kept the boys pretty busy for a week, but it is now finished. It is, I believe, lit by electric light; but I do not think they have allowed for urinals. I fear that with youths of both sexes in their night attire the ground may become fouled with moisture, if the old phrase for the condition in which we are when awaiting our Final exam is a true description of the physiology of fear. I believe it is in the Good Book, but a hasty glance through my Cruden does not enable me to put my finger on it.

So *The Lancet* has gone to Aylesbury. My only visit there was by bicycle from Hampstead in 1898—it was 80 miles and I was whacked at the end of it. Now slips of girls do 120 in a day, I believe, and do not turn a hair. I suspect it is the road surface, but the bicycles are also lighter, higher-geared, many-geared and have free-wheels. I remember Aylesbury on market day as the sleepiest old country town I have ever seen—except perhaps Wareham. I suppose the war has changed all that.

* * *

Oxford in war-time sets one wondering. Balliol and Christchurch have large yellow notices outside announcing that they are air-raid shelters, while behind boards the new Bodleian, just out of its scaffolding, reminds us of the things we used to think worth building. I suppose there are reasons which justify smashing up all the lovely things in this world, but here they seem very remote and rather inadequate. Oxford always reminds me of the Old Town at Frankfurt, where I've spent so many happy days. I don't quite see how a tit-for-tat argument with bombs (you smash our Magdalen, we smash your Römer) does advance the political organisation of humanity. If both sides can and do confine themselves to pamphlets and military objectives, in the gentlemanly way they have done so far, war may yet become a civilised occupation for those who like it. I suppose the real trouble will begin when one side starts to get the worst of it.

* * *

To get back to Oxford, and, in particular, the Radcliffe. There, evacuation of convalescents has been followed by an influx of London evacuees. The neurosurgical department is as busy as ever—everyone seems to want to get their skulls cracked by Mr. Cairns before bombs do it for them. Each month Oxford is being called upon to find accommodation for 200 London women in their last days of pregnancy. Some of them are in the fine new maternity block at the Radcliffe, some in Ruskin College, some in Eynsham Hall, and some in the new casual ward at Kidlington. After delivery they are either to be billeted in the district or returned to London. Where the Thomas's and Guy's students are to stay when they arrive at Oxford, I don't know.

* * *

The Radcliffe also accommodates the extremely efficient municipal cleansing station. Cleansing these days means removing mustard gas rather than bugs or acarids. In an outer chamber the outer garments of the contaminated are removed. Then the sheep are separated from the goats—the males into one stripping-room, the females into another. Each then passes through a double row of showers, in the middle of which are arrangements for eye douching. Finally, fresh clothes are provided and the fortunate decontaminees of Oxford emerge from a common door, regardless of sex.

* * *

A great many people are hoping or fearing that the Ministry of Health's emergency medical service is the beginning of state medicine. The shower of criticisms which it is at present receiving would not perhaps have burst if the expected cataclysm of bombs had descended on London. As it is, a great many doctors are twiddling their thumbs and thinking about their salaries. The only people who seem to be completely satisfied with their share of the new national debt are the house-officers, who receive from a benevolent Government the princely wage of £350 a year plus an extra £100 if living out. This is about £350 a year more than most of them have been accustomed to receive. The higher doctors, if ranking as specialists, bag £800 a year, while if classed only as medical officers they must be content with £550 a year. A few chosen individuals in charge of whole hospitals pass the thousand mark. In the old days of voluntary hospitals and honorary staffs, a man could hope to make £1000 at 35 even if he was one of a staff of perhaps forty honoraries. In the new scheme of things that privilege appears to be reserved for one member of the hospital staff only. Not unnaturally the seniors think it would be a good thing to dock some of the house-officers' salaries to augment their own. And it must be admitted that there is something in the argument. The young man recently qualified living in residence has no expenses beyond his clothes, an occasional hair-cut, and a sports car. With petrol rationing even the sports car is redundant. The older man with a wife, a house or flat, a room in Harley Street and a couple of sons at a public school can look forward only to an increasing burden of personal debt in the service of his country. At the same time, the case for paying the house-officer a reasonable salary is a strong one. In the past those of us who were unfortunate enough to have no private means have been thankful that resident appointments left little free time in which to study our poverty. The London voluntary hospitals have traded on the value of resident appointments to get cheap labour, and only in the provinces have most house appointments been paid. The Ministry has at least put a stop to this exploitation of the youth. One only hopes that it will also find some way of doing justice to age.

* * *

Two workmen were sitting opposite me in the train discussing the war. One of them said, "When I get home at night I always switch off the jazz on the wireless and tune in to a German station. I don't hate the Germans, they make such tuneful music."

". . . I think the day is coming when we shall stop talking about 'mental disease' and 'physical disease' because I am convinced it is an artificial and wrongful separation. The human organism becomes ill, and one cannot separate the human organism into separate entities any more than one can consider it apart from its environment. I say the distinction is an artificial one because it was thought that dementia paralytica was a 'mental disease' and then was discovered to be caused by the spirochete. Does it now become a physical disease with mental symptoms? It may be demonstrated that there is scarcely a physical disorder that doesn't have its mental concomitants—a carbuncle on a patient's neck has a definite influence on his personality! More difficult, perhaps, but just as logical is the assumption that there is no so-called mental disease that does not have its physical concomitants which may ultimately be demonstrated.—C. CHARLES BURLINGAME, *J. Amer. med. Ass.* July 29, 1929, p. 379.

OBITUARY

FREDERICK SPENCER LISTER

KT., M.R.C.S., LL.D. CAPETOWN

Sir Spencer Lister, who died at Johannesburg on Sept. 6 at the age of 63, had been director for the last fifteen years of the South African Institute for Medical Research. He will be remembered as one who boldly applied the principles of immunology on a large scale to the needs of the community. For some time past he had suffered from the strain of constant diligence, and it was a heart attack which ended his life suddenly in the library of the institute.

Frederick Spencer Lister was born at Norwell, Notts, and after a private education he entered St. Bartholomew's Hospital, where he qualified in 1905. Two years later he went out to the Cape as medical officer to the Premier diamond mines, spending five years there before going on to the Rand gold mines at Johannesburg. One of the gravest problems of the gold-mining industry was then the high death-rate from pneumonia amongst the native labourers. After a favourable trial by A. J. Orenstein of active immunisation with pneumococcal vaccine, Lister was entrusted with the task of doing a grand-scale experiment in preventive medicine. In those days little was known of specific bacterial antigens. Lister typed the South African pneumococci, working concurrently with the American bacteriologists who were then attempting to classify them; but, it should be added, quite independently. Some may regret that the American nomenclature was retained rather than Lister's. In this great experiment Lister had not the advantage of knowing what part in pneumonia was played by associated bacteria, nor had he the opportunity of statistical planning. Certain it is that the death-rate from pneumonia among the native labourers dropped sharply between 1916 and 1920, concurrently with the mass inoculation. But it must not be overlooked that from 1911 on the recruitment of tropical natives had ceased and improvement had already set in. For this work Lister received a well-earned knighthood in 1920. Four years later he succeeded Dr. Watkins-Pitchford as director of the South African research institute and became president of the associated scientific and technical societies of South Africa. When the University of Witwatersrand came to include a complete medical school Lister was appointed honorary professor of pathology and bacteriology, the actual teaching being delegated to members of the staff of the institute, an arrangement which served well to keep the school and the institute in close touch. From 1928 he served on the South African Medical Council, and in the following year the University of Capetown conferred upon him the honorary degree of LL.D.

The impression Lister gave on his co-workers was that of a keen and critical worker with a true interest in research. A man of personal modesty, he was well liked by those who came in contact with him and valued his simple forthright character. His laboratory gifts, as befitted a pupil of Almroth Wright, were of a high order. They were on the technical side rather than in the imaginative field, and it may be for this reason that one of the largest human epidemiological field experiments failed to give as much information as it might have done. Outside his devotion to laboratory medicine Lister had few interests apart from sport.

Sir Spencer Lister was twice married. His first wife, who died in 1919, was the daughter of Leonard Baker. In 1921 he married Ruby May, younger daughter of W. P. Johnstone of Durban, who survives him with a son and a daughter.

NEW ZEALAND

(FROM OUR OWN CORRESPONDENT)

NATIONAL HEALTH INSURANCE

THERE is no further development in the national health insurance scheme. The government has been occupied with the budget, which includes considerable increases in taxation, particularly on income and petrol. The Prime Minister has just been operated on, the Finance Minister is still abroad and the Health Minister has been acting as prime minister in addition to his other duties. A revised scheme for maternity services, including provision for extra payments for complications and consultant services, without any contract between doctors and government, is under discussion. It is being voted on by members of the B.M.A. by secret ballot, and the results are not yet published. It was announced before the ballot that the government had accepted the scheme in principle.

STAFF CHANGES AT AUCKLAND HOSPITAL

Eighteen months ago the board created two new full-time posts at Auckland Hospital, the chiefs of the divisions of medicine and surgery, at salaries of £N.Z.1500–2000. There was no consultation with the honorary staff about this step, but when Dr. C. R. Burns and Mr. J. M. Clarke were appointed, it was on the advice of a wide and representative medical committee. This feature made the occasion noteworthy. Never before in medical appointments had any expert advice been properly sought, much less acted on. These reforms were part of a larger scheme, planned to include the abolition of the post of medical superintendent, and were intended to introduce more order and responsibility on the clinical side. Certain influences were brought to bear, and the post of M.S. was not abolished. The two appointees arrived after some months, to find their powers already diminished on paper. A change of board (elected by popular vote every three years) confirmed their impression that they were not really wanted, and after about a year of office their appointments were terminated on the score of economy. Only one member (a junior physician) of the honorary staff has recorded publicly a protest against such summary dismissal of two eminent men. The profession has been silent, but considerable public protest has been made, including a petition from the bulk of the in-patients, and another from a large majority of the nursing staff. By these it was claimed that since the men had arrived the general tone and morale of the hospital had improved, and that gaps in the work of the hospital left by the honorary system of staffing had been filled. While it is clear that most of the senior members of the staff desired the abolition of the posts, there is a section of the middle and junior group in the city that deplores the move. These see in it a setback to proper coördination of the clinical work, and to the introduction of academic standards into the appointment of the honorary staff.

UNIVERSITY OF OXFORD.—The appointment of a deputy to carry on the duties of Dr. Lee's professorship of anatomy has been cancelled, as Prof. W. E. Le Gros Clark, F.R.S., has withdrawn his resignation from the professorship.—Dr. K. J. Franklin is deputising for Dr. B. G. Maegraith as dean of the medical school.

Medical News

General Medical Council

An election is about to be held of one member of the General Medical Council to represent the registered medical practitioners resident in England. Nomination papers, which must be signed by not fewer than twelve registered medical practitioners, must reach the registrar before Oct. 3.

Royal Cancer Hospital (Free)

The course in physics and medical radiology to be held at this hospital will begin on Oct. 3 as arranged. Further information will be found in our advertisement columns.

Radium

The National Radium Commission has indicated that radium treatment is likely to prove impracticable in the earlier stages of the war, and centres have taken steps for the continuous storage of their radium underground. According to *The Times*, most of the national stock has been buried in a 50-ft. bore-hole drilled specially for the purpose. When more experience of war conditions is available it is hoped that it may be possible to resume treatment. Correspondence for the Radium Commission should be addressed, until further notice, to the office secretary at 18, Park Crescent, London, W.1.

EMERGENCY NOTICES

The annual meeting of the British Medical Association which was to have been held in Birmingham next year will not take place.

The annual conference of surgeons of the St. John Ambulance Brigade, which was to have been held in London on Oct. 14, has been cancelled.

The course of lectures on neurology which was to have been held at the National Hospital, Queen Square, London, this autumn will not take place.

No meeting of the Society of Public Analysts and other analytical chemists will be held until further notice.

The St. Marylebone and Western General Dispensary is open for outpatient treatment only, and a list of the clinics which are carrying on may be had from the secretary of the hospital, 48, Cosway Street, London, N.W.1.

The British Hospital for Mothers and Babies, Woolwich, has received permission to retain all its 52 beds for the use of women in and after labour. Although already fully booked for the next seven months it has undertaken to receive all the maternity patients from the Garrison Maternity Hospital and the War Memorial Hospital, Woolwich.

Of the 60 beds at the Plaistow Maternity Hospital 40 have been vacated; the remaining 20 are being used for emergency and abnormal midwifery cases. Many of the expectant mothers of the district have been evacuated and several midwives have gone with them, but there are still a great number who have refused to leave and the majority of these will have to be confined in their own homes by the midwives attached to the hospital.

The Chadwick public lectures which were to have been delivered this autumn have been postponed for the present. Notice will be given when they are to be resumed.

For the duration of the war, the head office of Messrs. Watson & Sons (Electro-Medical) Ltd. will be at 76, Castle Street, Reading. (Tel. Reading 60295; telegrams "Skiagram Reading.") Their London office and all branches, with the exception of Glasgow, will remain open for sales and service.

The King's College Hospital annual dinner of past and present students has been cancelled.

MRS. BURDEN, benefactress of the Stoke Park colony, Bristol, has died. Her husband, the Rev. Harold Burden, founded the colony, and after his death she continued to live there, her last gift being the neurological institute which was opened by Sir Thomas Inskip on May 12.

Appointments

BRASS, SYDNEY, assistant physician to the skin department, St. Paul's Hospital, Endell Street, London.
BRODY, M.B., M.B. Sheff., D.P.M., senior resident physician at the Runwell Mental Hospital, Wickford, Essex.
CLAYTON, T. M., M.D. Durh., D.Hy., D.P.H., D.T.M., medical officer of health for Blaydon-on-Tyne.
HAMILTON, BETTY C., L.R.C.P.E., L.D.S.R.C.S.E., D.P.H., assistant school medical officer for Derby.
JACKSON, D. C., M.B. Melb., resident medical officer at the Birmingham Children's Hospital (King Edward VII Memorial).
MACFARLANE, G. N., M.B. Dubl., resident surgical officer at Birmingham Children's Hospital (King Edward VII Memorial).
MAYEUR, MARY H., M.D. Lond., F.R.C.S., M.R.C.O.G., obstetric assistant and tutor at the Liverpool Maternity Hospital.
PEMBERTON, MAX, M.B. N.Z., F.R.C.S., surgical registrar at the Aberdeen Royal Infirmary.
SUTHERLAND, CATHERINE M., M.B. Edin., resident medical officer at the Jessop Hospital for Women, Sheffield.
WATSON, A. J., M.D. Durh., B.Hy., D.P.H., medical superintendent at the Mildmay Mission Hospital, London.

Examining Surgeon under the Factories Act, 1937: Dr. J. G. CLARK (Dundee district, Angus).
Medical Referee under the Workmen's Compensation Act, 1925: Mr. H. W. GABE, F.R.C.S., for the county-court districts of Haverford West, Pembroke Dock, and Narbeth.

Births, Marriages and Deaths

BIRTHS

CHANCE.—On Sept. 14, at Dublin, the wife of Dr. Oliver Chance—a daughter.
FORSYTH.—On Sept. 15, at Royal Naval Air Station, Winchester, the wife of Surgeon Lieut.-Commander A. N. Forsyth—a son.
PARKES.—On Sept. 16, at Oxford, the wife of Mr. A. S. Parkes, D.Sc.—a daughter.
STEPHENS.—On Sept. 10, at Srinagar, Kashmir, the wife of Captain K. R. Stephens, R.A.M.C.—a son.
WILKINSON.—On Sept. 11, the wife of Dr. M. C. Wilkinson, of the Essex County Sanatorium, Black Notley—a daughter.

MARRIAGES

BIRT—HUSBAND.—On Sept. 15, Alan Beckett Birt, M.B., to Joyce Staunton Husband.
CHAMBERS—STEVENS.—On Sept. 9, Captain Alfred Chambers, R.A.M.C., to Susanna Ruth Stevens.
COOMBS—BLAND.—On Sept. 9, at Bristol, Charles John Franklin Coombs, M.B., to Barbara Bland.
CUTTING—MASTERS.—On Sept. 15, at Wimbledon Park, Alfred Howard Cutting, M.R.C.S., to Margery Masters, B.Sc.
JONES—STRONG.—On Sept. 9, at Bisley Church, William Alyn Jones, M.R.C.S., to Doris Whitley Strong.
PAGE—STEPHENSON.—On Sept. 9, at Claygate, Ernest Donald Page, M.B., to Isobel Margaret Torrance Stephenson.
VAN MEURS—WYKES.—On Sept. 14, at Kingswood, Dennis Peter van Meurs, M.B., to Marjorie Norah Wykes.
WEST—FLEMING.—On Sept. 7, at Ardee, Eire, Robert George Ranyard West, M.D., M.R.C.P., to Jean Edith Fleming.
WYON—MITCHELL.—On Sept. 15, at Leeds, Peter Hitchcock Wyon, M.B., to Agnes May Mitchell, M.B.

DEATHS

HONEYWILL.—On Sept. 17, Laurence John Honeywill, F.R.C.S., of Bournemouth.
JOHNSTONE.—On Sept. 17, at Preston, Thomas Johnstone, M.D. Edin., M.R.C.P., late of Ilkley and Harrogate, aged 86.
KENNEDY.—On Sept. 12, at Bucklebury Common, Berks, David Kennedy, M.D. Lond.
LOCKYER.—On Sept. 14, Gerard Edward Lockyer, M.R.C.S., of Roughton, Norfolk, late captain, R.A.M.C.
ROBINSON.—On Sept. 16, at Glasgow, Harry Watt Robinson, M.B. Glasg., of Bridge-of-Weir.
WILLIAMS—On Sept. 14, at Horsham, Alfred Henry Williams, M.D. Edin., aged 75.

The Lancet 100 Years Ago

September 21, 1839, p. 932

From a leading article on the case of the Apothecaries Company v. Greenough

The public will be the greatest sufferers by the anarchy of the medical profession. The lives lost by murder, manslaughter, lightning, precipitation from monumental columns, hydrophobia, explosions in mines, shipwreck, and accidents of every kind, will be inconsiderable when compared with the numbers that must perish legally, on one hand, by the injudicious administration of poisonous drugs; and, on the other, by the absence of the skilful, well-directed, energetic treatment of the scientific practitioner.

NOTES, COMMENTS AND ABSTRACTS

FILMS FOR DOCTORS

THE world we live in has sharpened our eyesight perhaps at the expense of our hearing. The teacher of today realises that many of his pupils are more sensitive to visual than to auditory impressions and he neglects no medium that appeals to the eye. The film as an auxiliary in medical education, and especially in postgraduate medical education, was discussed by Dr. E. Kittler at a recent meeting of the Berliner Medizinische Gesellschaft (*Dtsch. med. Wschr.* Aug. 4, 1939, p. 1242). One of the most obvious uses of films is to show the doctor minor surgical procedures which he may use in his own consulting-room. Films of major surgical operations are also of some value to the postgraduate. Such films should not be overloaded with detail, but should concentrate on general methods and end-results. In obstetrics and gynæcology the film can to some extent compensate for the scarcity of clinical teaching material available to postgraduates. Medical subjects do not at first sight seem appropriate to illustration. Kittler suggests, however, that if we were less shy of using trick photography there is a wealth of material waiting to be used. An article by Rosenthal in our own columns (1938, **2**, 546) describes some ingenious methods of graphic instruction that might be embodied in cinematography.

DEARER DRUGS

THE wholesale prices of the following drugs have increased substantially: tannic acid, ephedrine, phenazone, sulphanilamide, atropine, ergot of rye, cascara sagrada, gentian root, tragacanth, gum acacia, agar agar, aloes, ipecacuanha, hydrastis, rhubarb, menthol, senega root, colocynth, cod-liver oil, olive oil, eucalyptus oil, peppermint oil and aniseed oil. Some of these—tannic acid, ephedrine, cascara sagrada and ergot of rye—have doubled in price. There has been a further advance in the price of bismuth carbonate, while makers of resublimed iodine, iodoform, potassium iodide and sodium iodide have, as anticipated, raised their prices to correspond, more or less, with the increase in the cost of crude iodine noted last week. The prices of calomel, corrosive sublimate and other salts of mercury have not been advanced as yet, but in view of the rise in quicksilver, higher prices for these drugs are likely. Potassium bromide, as well as other bromides, is dearer. Although the official price of quinine has not altered, this as well as chloral hydrate should be dispensed with caution. A rise in the price of camphor is almost inevitable for the reason that turpentine, the key to synthetic camphor, is twice the price it was before the war; competition from synthetic camphor has kept low the price of the Japanese natural product. These notes may serve as an indication to prescribers.

A LOCAL USE FOR TESTOSTERONE

Mr. J. R. Groome, of the department of zoology and comparative anatomy at Oxford, informs us of the successful use of testosterone propionate as a local application in the case of a uniparous woman of 33 who had difficulty in attaining an orgasm during sexual intercourse. Her external genitalia were normal except that the clitoris was so small that she was unaware of its existence. An ointment containing testosterone propionate was introduced into the preputial sac with a small syringe twice daily, beginning at the end of one menstrual period and continuing until four days before the next. The patient received approximately 6·6 mg. testosterone propionate by unction in seventeen days, the doses increasing as the treatment caused a slight enlargement of the preputial sac. A considerable increase in the clitoris was then reported, and the treatment was resumed for a further five days after the next menses. The preputium was now found to be enlarged, and the glans clitoridis, which had drawn the frenulum with it, was normally just visible. A month later the preputium had regressed to almost its normal size, but the clitoris and frenulum however had been maintained, and the resulting new erogenous zone was considered highly satisfactory. Mr. Groome concludes that "rather less than 7·6 mg. testosterone propionate administered by local unction over a period of twenty-two days will cause enlargement of the human clitoris without affecting the other genitalia or delaying the menses."

HANDWRITING

GRAPHOLOGY has been much exploited by charlatans in the past and for this reason has come to be associated in the public mind with the occult. It is regarded far more seriously on the Continent than in England, and there are recognised courses on the subject in several European universities. In his "Analysis of Handwriting" (London: Geo. Allen and Unwin, pp. 232, 7*s.* 6*d.*) H. J. Jacoby treats graphology as a science and interprets his results on an accurate psychological basis. The reader will have no difficulty in following his easy style but must not expect to be an expert graphologist when he has reached the last page. If Jacoby's remarks on illegibility are true, most doctors fall into the category of neurotic people wishing to conceal their weaknesses from the world.

LIGATURES

Mr. J. E. H. Roberts, F.R.C.S., writes: "On my visits to numerous hospitals in the London sector I find that in some cases there is anxiety about the stock of catgut for ligatures. While I am assured by the Ministry of Health that adequate stocks are held in the country, there may be here and there a lag between demand and supply. Under these circumstances may I suggest that fine linen thread, silk or sewing cotton may replace catgut for the ligation of vessels? In fact these substances in many respects have an advantage over catgut. No. 100 thread and No. 24 cotton which are obtainable from any draper are suitable, though many other sizes are also useful. In the same way linen thread or silk, preferably black, may replace silkworm gut for skin suture."

Vacancies

Barnsley, Beckett Hospital and Dispensary.—Cas. O., £250.
Belfast Mental Hosp.—Asst. M.O., £350.
Brighton, New Sussex Hospital for Women, Windlesham Road.—H.P. at rate of £100.
Burnley County Borough.—Sen. Asst. M.O.H., £800.
Doncaster Royal Infirmary.—Orthopædic H.S., at rate of £150. Also H.S. at rate of £150.
Dudley, Guest Hosp.—H.S., £150.
Dunedin Hosp., New Zealand.—Radiotherapist, £1100.
Kettering and District General Hosp.—Jun. H.S., at rate of £150.
Macclesfield, Cheshire County Mental Hosp., Parkside.—Asst. M.O., £350.
Manchester Northern Hosp.—Hon. surgeon.
Reading, Royal Berkshire Hosp.—H.S., H.P., and Cas. O., each at rate of £150.
St. Helens County Borough.—Temp. Asst. M.O.H. for Tuberculosis, £600.
Stafford, Staffordshire General Infirmary.—H.S., £175.
Stockport Infirmary.—Res. Surg. O., £250.
Watford Borough.—Temporary Asst. M.O.H., £600.
Medical referees under the Workmen's Compensation Act, 1925, for the county-court districts of Holywell, Flint, and Mold (circuit No. 29). Also ophthalmic specialist medical referee for the county-court districts of Accrington, Blackburn and Clitheroe, Blackpool, Chorley, Lancaster, and Preston (circuit No. 4). Applications for these appointments to the private secretary, Home Office, Whitehall, London, S.W.1, before Oct. 8.
Medical Referee under the Workmen's Compensation Act, 1925, for the Kirkcudbright sheriff court district (Sheriffdom of Dumfries and Galloway). Applications to the private secretary, Scottish Office, Whitehall, London, S.W.1, before Oct. 8.
The Chief Inspector of Factories announces the following vacancies for examining surgeons: Lauder, Berwick; Carnforth, Lancaster; Morpeth, Northumberland.